

1241221 - R8 SDMS



Third West Weekly Report  
Shepherd, Michael

to:

Joyce Ackerman, 'Craig Barnitz (cbarnitz@utah.gov)'

07/20/2012 03:47 PM

Hide Details

From: "Shepherd, Michael" <Michael.Shepherd@rockymountainpower.net>

To: Joyce Ackerman/R8/USEPA/US@EPA, "'Craig Barnitz (cbarnitz@utah.gov)'"  
<cbarnitz@utah.gov>

6 Attachments



Weekly Reports 07-09 to 07-12-12.pdf Third West Weekly Log 2012-28.pdf 239873-1R.pdf 239991-1.pdf 239995-1.pdf



240072-1.pdf

Joyce & Craig,

Attached are the reports for the week of July 9, 2012.

All air monitoring results came back negative, except for a chrysotile hit on Monday last week.

Please let me know if you have any questions.

Thanks,

Mike Shepherd  
Project Manager  
Rocky Mountain Power - Major Projects  
801.220.4584 Office  
801.631.1310 Cell  
801.220.2797 Fax  
[michael.shepherd@pacificorp.com](mailto:michael.shepherd@pacificorp.com)

# 3<sup>RD</sup> WEST SUBSTATION REMEDIATION PROJECT

## HEALTH SAFETY MANAGER (HSM)

### DAILY CHECKLIST

DATE: 07/09/12

#### General

NA Work area Health and Safety Inspection

NA Review and if necessary update Activity Hazard Analyses (AHA) based on planned site activities for the day

NA Safety Planning or "Tailgate" mandatory meeting for all employees and contractors prior to commencement of any site work. Instruction, review hazards, health & safety issues and any modifications to the CSHASP

NA Site hazard and safety instruction for all first time employees, contractors or visitors

NA Complete Employee Meeting Record Form B (where applicable)

NA Document required Respirator Training completion with Form H

NA Record times and numbers of dump trucks and trailers as they leave the site with contaminated material.

NA Confirm return of waste material manifest documents for each load with site manager.

NA Complete all CSHASP Forms (for applicable activities planned for that day)

NA Illness/Injury Report Form A

NA Site-Specific Training Record Form C

NA Hot Work Permit Form D

NA Trench/Evacuation Permit Form E

NA Combined Space Entry Permit Form F

Exclusion zone operations are practiced as instructed.

NA Decontamination unit is working properly.

NA Workers are using decontamination unit as instructed.

NA Workers use personal protective equipment properly.

☒ Set air samples at cardinal compass points around exclusion zone. Check throughout the day to ensure proper operation.  
Observe control measures for dust and fugitive materials i.e. watering excavation sites and track out prevention.

☒ Review sign-in/sign-out log throughout and at the end of the workday.

☒ Secure the site at the end of the workday

#### Sampling

NA Soil Confirmation sampling for any newly excavated areas

NA Stationary Air Monitoring during contaminated soil removal around the perimeter of the exclusion zone

NA Personal Breathing Zone Monitoring on personnel conducting contaminated dust and soil removal

NA Digitally photograph each sample location and at any place field sampling personnel determined necessary

- ☒ Electronically file photo files into the on-site database
- ☒ Complete Field Documentation
  - ☒ Field Sample Data Sheets (FSDS)
  - ☒ Logbook
  - ☒ On-site computer database
- ☒ Label each sample media with a unique number
- ☒ Seal sample(s) in zip lock plastic bags
- ☒ Complete and include Chain of Custody (COC) Form required for shipping of samples to appropriate laboratory
- ☒ Package samples for transport IAW SOP 2-1, Packaging and Shipping of Environmental Samples
- ☒ Review and disseminate sample results as received from the laboratories to Project Manager and other appropriate managers and employees
- ☒ Electronically file sample reports into on-site database



## 3<sup>rd</sup> West Substation Site Project Safety Audit

Project: 3<sup>rd</sup> West Sub Station

Date: 07/09/12

Location: 3<sup>rd</sup> West, 1<sup>st</sup> South, SLC

Job Number: \_\_\_\_\_

Survey Conducted By: Justin Kargis

Title: \_\_\_\_\_

Standard	Title	In Compliance	Out of Compliance	N/A	Corrective Action Taken and Date
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1926.59	Hazard Communication Program, List of Chemicals, Training, MSDSs.			x	
1926.500 (b) & (d) (old standard)	Guardrails on open sided floors, floor holes and runways.			x	
1926.404 (b)	Ground fault circuit interrupters or an assured equipment grounding conductor program in use.	x			
1926.451 (b)	The employer shall instruct each employee in the recognition and avoidance of unsafe conditions.			x	
1926.451 (d)	Tubular welded scaffolds shall be properly braced so that they are plumb, square and rigid; legs on plumb, adjustable, mud sills, etc. to support the maximum load; guardrails and toe boards shall be installed.			x	
1926.100 (a)	Head protection, where there is a possible danger of head injury.	x			



Standard	Title	In Compliance	Out of Compliance	N/A	Corrective Action Taken and Date
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1926.652 (a) (1)	Excavation protective systems; examination by competent person when less than 5 feet in depth.			x	
1926.20 (b) (2)	Employer responsibility to initiate and maintain safety and health programs.			x	
1926.20 (b) (1)	Employer responsibility to provide for frequent and regular inspections by designated competent persons.			x	
1926.451 (e)	Manually propelled scaffolds shall have tight planking for the full width, platforms secured, ladder or stairway provided, suitable footing, stand plumbs, wheels locked, guardrails and toe boards.			x	
1926.1052 (c) (1)	Stair rail and handrail along each unprotected edge.			x	
1926.25 (a)	Debris, scrap lumber with protruding nails, not cleared for work areas, stairs and around structures.			x	
1926.50	First aid shall be available in the absence of an infirmary, or other that is reasonably accessible; first aid supplies shall be accessible and telephone numbers posted.	x			
1926.451 (a) (13)	Scaffolding safe access not provided by ladder or equivalent.			x	
1926.651 (k) (1)	Excavations, protective systems, inspected daily by a competent person and as needed.			x	
1926.403 (b) (2)	Employer shall ensure electrical equipment is free from recognized hazards, is suitable, used in accordance with the listing, labeling or certification.	x			

Standard	Title	In Compliance	Out of Compliance	N/A	Corrective Action Taken and Date
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1926.451 (a) (4)	Scaffolding shall have guardrails and toe boards when more than 10 feet high and when less than 45 inches of work space.			x	
1926.405 (g) (2)	Flexible cords shall be used without splice or tap; strain relief shall be provided.			x	
1926.405 (b)	Electrical boxes, fittings shall have covers, faceplates or canopy and holes shall be smooth where cords pass through; and unused openings in cabinets/boxes shall be closed.	x			
1926.701 (b)	Reinforcing steel onto which employees could fall shall be guarded.			x	
1926.1053 (b) (1)	Portable ladder side rails extend at least 3 feet or be secured at top.			x	
1926.651 (j) (2)	Excavations shall have materials or equipment placed at least 2 feet from the edge.			x	
1926.651 (c) (2)	Excavations shall have a safe means of egress such as ladders, ramps, etc.	x			
1926.150 (c) (1)	Portable fire fighting equipment shall be provided and extinguishers shall be inspected periodically.	x			
1926.102 (a) (1)	Eye and face protection shall be provided.	x			
1926.300 (b) (2)	Guards for power tools shall be used and moving parts of equipment shall be guarded.	x			
1926.350 (a) (9)	Oxygen cylinders in storage shall be separated from fuel gas cylinders by at least 20 feet or a 1/2 fire resistance barrier.			x	
1926.405 (a) (2) (ii) (e) & (f)	Temporary lights shall be protected from breakage, not suspended by their cords and extension cord.			X	

Standard	Title	In Compliance	Out of Compliance	N/A	Corrective Action Taken and Date
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1926.405 (a) (2) (ii) (j)	Extension cords used with portable electric tools shall be of three wire type and designed for hard or extra hard usage.	x			
1926.105 (a)	Workplaces more than 25 feet above the ground or water shall have safety nets when ladder, safety line/belts, temporary floors, scaffolds, catch platform are not practical.			x	
1926.1051 (a)	Stairway or ladder shall be provided at all access points where there is a break in elevation of 19 inches or more.			x	
1926.451 (a) (2)	Scaffolding footing or anchorage shall be sound, rigid and capable of carrying the maximum intended load.	x			
1926.500 (c) (1) (old standard)	Wall opening shall be guarded.			x	
1926.404 (f) (7)	Electrical equipment connected by cord and plug shall be grounded except if there is an isolating transformer or the tool is double insulated.	x			
1926.556 (b) (2)	When working from an aerial lift, a full body harness and lanyard attached to the boom or basket.	x			
1926.501 (b) (1) (new standard)	Guardrails, safety nets or personal fall arrest system shall be used at 6 feet or more.			x	
1926.451 (a) (14)	Scaffold planking shall extend over their end support not less than 6 inches and not more than 12 inches.			x	
1926.602 (a) (9)	Bi-directional earth moving equipment shall have audible alarms.	x			

<i>Standard</i>	<i>Title</i>	In Compliance	Out of Compliance	N/A	<i>Corrective Action Taken and Date</i>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1926.451 (a) (3)	Scaffolding shall be erected, moved, dismantled or altered under the supervision of a competent person.			x	
1926.550 (b) (2)	Cranes, crawler, truck or locomotive, shall meet the design, testing, maintenance, and operation per ANSI B30.5_1968. The most recent certification shall be on file until a new one is prepared.			x	

**Comments:**

CVE line crew continued excavated for and placing ground grid in UTA yard. They applied water to dig sites and spoils that were placed on stockpile for removal.

CVE electricians excavated for control cables around 46 kV yard. They were instructed to apply water to these excavations and remove all spoils to the stockpile as well.

Weather was hot and sunny with light breezes and high temperatures around 100.

# 3<sup>RD</sup> WEST SUBSTATION REMEDIATION PROJECT

## HEALTH SAFETY MANAGER (HSM)

### DAILY CHECKLIST

DATE: 07/10/12

#### General

##### NA Work area Health and Safety Inspection

- NA Review and if necessary update Activity Hazard Analyses (AHA) based on planned site activities for the day
- NA Safety Planning or "Tailgate" mandatory meeting for all employees and contractors prior to commencement of any site work. Instruction, review hazards, health & safety issues and any modifications to the CSHASP
- NA Site hazard and safety instruction for all first time employees, contractors or visitors
- NA Complete Employee Meeting Record Form B (where applicable)
- NA Document required Respirator Training completion with Form H
- NA Record times and numbers of dump trucks and trailers as they leave the site with contaminated material.
- NA Confirm return of waste material manifest documents for each load with site manager.
- NA Complete all CSHASP Forms (for applicable activities planned for that day)
  - NA Illness/Injury Report Form A
  - NA Site-Specific Training Record Form C
  - NA Hot Work Permit Form D
  - NA Trench/Evacuation Permit Form E
  - NA Combined Space Entry Permit Form F
  - Exclusion zone operations are practiced as instructed.
  - NA Decontamination unit is working properly.
  - NA Workers are using decontamination unit as instructed.
  - NA Workers use personal protective equipment properly.
- ☒ Set air samples at cardinal compass points around exclusion zone. Check throughout the day to ensure proper operation.  
Observe control measures for dust and fugitive materials i.e. watering excavation sites and track out prevention.
- ☒ Review sign-in/sign-out log throughout and at the end of the workday.
- ☒ Secure the site at the end of the workday

#### Sampling

- NA Soil Confirmation sampling for any newly excavated areas
- NA Stationary Air Monitoring during contaminated soil removal around the perimeter of the exclusion zone
- NA Personal Breathing Zone Monitoring on personnel conducting contaminated dust and soil removal
- NA Digitally photograph each sample location and at any place field sampling personnel determined necessary

- ☒ Electronically file photo files into the on-site database
- ☒ Complete Field Documentation
  - ☒ Field Sample Data Sheets (FSDS)
  - ☒ Logbook
  - ☒ On-site computer database
- ☒ Label each sample media with a unique number
- ☒ Seal sample(s) in zip lock plastic bags
- ☒ Complete and include Chain of Custody (COC) Form required for shipping of samples to appropriate laboratory
- ☒ Package samples for transport IAW SOP 2-1, Packaging and Shipping of Environmental Samples
- ☒ Review and disseminate sample results as received from the laboratories to Project Manager and other appropriate managers and employees
- ☒ Electronically file sample reports into on-site database



## 3<sup>rd</sup> West Substation Site Project Safety Audit

**Project:** 3<sup>rd</sup> West Sub Station

**Date:** 07/10/12

**Location:** 3<sup>rd</sup> West, 1<sup>st</sup> South, SLC

**Job Number:** \_\_\_\_\_

**Survey Conducted By:** Justin Kargis

**Title:** \_\_\_\_\_

Standard	Title	In Compliance	Out of Compliance	N/A	Corrective Action Taken and Date
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1926.59	Hazard Communication Program, List of Chemicals, Training, MSDSs.			x	
1926.500 (b) & (d) (old standard)	Guardrails on open sided floors, floor holes and runways.			x	
1926.404 (b)	Ground fault circuit interrupters or an assured equipment grounding conductor program in use.	x			
1926.451 (b)	The employer shall instruct each employee in the recognition and avoidance of unsafe conditions.			x	
1926.451 (d)	Tubular welded scaffolds shall be properly braced so that they are plumb, square and rigid; legs on plumb, adjustable, mud sills, etc. to support the maximum load; guardrails and toe boards shall be installed.			x	
1926.100 (a)	Head protection, where there is a possible danger of head injury.	x			

Standard	Title	In Compliance	Out of Compliance	N/A	Corrective Action Taken and Date
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1926.652 (a) (1)	Excavation protective systems; examination by competent person when less than 5 feet in depth.			x	
1926.20 (b) (2)	Employer responsibility to initiate and maintain safety and health programs.			x	
1926.20 (b) (1)	Employer responsibility to provide for frequent and regular inspections by designated competent persons.			x	
1926.451 (e)	Manually propelled scaffolds shall have tight planking for the full width, platforms secured, ladder or stairway provided, suitable footing, stand plumbs, wheels locked, guardrails and toe boards.			x	
1926.1052 (c) (1)	Stair rail and handrail along each unprotected edge.			x	
1926.25 (a)	Debris, scrap lumber with protruding nails, not cleared for work areas, stairs and around structures.			x	
1926.50	First aid shall be available in the absence of an infirmary, or other that is reasonably accessible; first aid supplies shall be accessible and telephone numbers posted.	x			
1926.451 (a) (13)	Scaffolding safe access not provided by ladder or equivalent.			x	
1926.651 (k) (1)	Excavations, protective systems, inspected daily by a competent person and as needed.			x	
1926.403 (b) (2)	Employer shall ensure electrical equipment is free from recognized hazards, is suitable, used in accordance with the listing, labeling or certification.	x			



Standard	Title	In Compliance	Out of Compliance	N/A	Corrective Action Taken and Date
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1926.451 (a) (4)	Scaffolding shall have guardrails and toe boards when more than 10 feet high and when less than 45 inches of work space.			x	
1926.405 (g) (2)	Flexible cords shall be used without splice or tap; strain relief shall be provided.			x	
1926.405 (b)	Electrical boxes, fittings shall have covers, faceplates or canopy and holes shall be smooth where cords pass through; and unused openings in cabinets/boxes shall be closed.	x			
1926.701 (b)	Reinforcing steel onto which employees could fall shall be guarded.			x	
1926.1053 (b) (1)	Portable ladder side rails extend at least 3 feet or be secured at top.			x	
1926.651 (j) (2)	Excavations shall have materials or equipment placed at least 2 feet from the edge.			x	
1926.651 (c) (2)	Excavations shall have a safe means of egress such as ladders, ramps, etc.	x			
1926.150 (c) (1)	Portable fire fighting equipment shall be provided and extinguishers shall be inspected periodically.	x			
1926.102 (a) (1)	Eye and face protection shall be provided.	x			
1926.300 (b) (2)	Guards for power tools shall be used and moving parts of equipment shall be guarded.	x			
1926.350 (a) (9)	Oxygen cylinders in storage shall be separated from fuel gas cylinders by at least 20 feet or a 1/2 fire resistance barrier.			x	
1926.405 (a) (2) (ii) (e) & (f)	Temporary lights shall be protected from breakage, not suspended by their cords and extension cord.			X	

Standard	Title	In Compliance	Out of Compliance	N/A	Corrective Action Taken and Date
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1926.405 (a) (2) (ii) (j)	Extension cords used with portable electric tools shall be of three wire type and designed for hard or extra hard usage.	x			
1926.105 (a)	Workplaces more than 25 feet above the ground or water shall have safety nets when ladder, safety line/belts, temporary floors, scaffolds, catch platform are not practical.			x	
1926.1051 (a)	Stairway or ladder shall be provided at all access points where there is a break in elevation of 19 inches or more.			x	
1926.451 (a) (2)	Scaffolding footing or anchorage shall be sound, rigid and capable of carrying the maximum intended load.	x			
1926.500 (c) (1) (old standard)	Wall opening shall be guarded.			x	
1926.404 (f) (7)	Electrical equipment connected by cord and plug shall be grounded except if there is an isolating transformer or the tool is double insulated.	x			
1926.556 (b) (2)	When working from an aerial lift, a full body harness and lanyard attached to the boom or basket.	x			
1926.501 (b) (1) (new standard)	Guardrails, safety nets or personal fall arrest system shall be used at 6 feet or more.			x	
1926.451 (a) (14)	Scaffold planking shall extend over their end support not less than 6 inches and not more than 12 inches.			x	
1926.602 (a) (9)	Bi-directional earth moving equipment shall have audible alarms.	x			

<i>Standard</i>	<i>Title</i>	In Compliance	Out of Compliance	N/A	<i>Corrective Action Taken and Date</i>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1926.451 (a) (3)	Scaffolding shall be erected, moved, dismantled or altered under the supervision of a competent person.			x	
1926.550 (b) (2)	Cranes, crawler, truck or locomotive, shall meet the design, testing, maintenance, and operation per ANSI B30.5_1968. The most recent certification shall be on file until a new one is prepared.			x	

**Comments:**

CVE line crew continued excavated for and placing ground grid in UTA yard. A separate line crew worked on capacitor bank equipment and assembly.

CVE electricians continued trenching and working on control cables around 46 kV yard.

Weather was hot and dry with temperatures around 100.

## 3<sup>RD</sup> WEST SUBSTATION REMEDIATION PROJECT

# HEALTH SAFETY MANAGER (HSM)

### DAILY CHECKLIST

DATE: 07/11/12

#### General

NA Work area Health and Safety Inspection

NA Review and if necessary update Activity Hazard Analyses (AHA) based on planned site activities for the day

NA Safety Planning or "Tailgate" mandatory meeting for all employees and contractors prior to commencement of any site work. Instruction, review hazards, health & safety issues and any modifications to the CSHASP

NA Site hazard and safety instruction for all first time employees, contractors or visitors

NA Complete Employee Meeting Record Form B (where applicable)

NA Document required Respirator Training completion with Form H

NA Record times and numbers of dump trucks and trailers as they leave the site with contaminated material.

NA Confirm return of waste material manifest documents for each load with site manager.

NA Complete all CSHASP Forms (for applicable activities planned for that day)

NA Illness/Injury Report Form A

NA Site-Specific Training Record Form C

NA Hot Work Permit Form D

NA Trench/Evacuation Permit Form E

NA Combined Space Entry Permit Form F

Exclusion zone operations are practiced as instructed.

NA Decontamination unit is working properly.

NA Workers are using decontamination unit as instructed.

NA Workers use personal protective equipment properly.

☒ Set air samples at cardinal compass points around exclusion zone. Check throughout the day to ensure proper operation.  
Observe control measures for dust and fugitive materials i.e. watering excavation sites and track out prevention.

☒ Review sign-in/sign-out log throughout and at the end of the workday.

☒ Secure the site at the end of the workday

#### Sampling

NA Soil Confirmation sampling for any newly excavated areas

NA Stationary Air Monitoring during contaminated soil removal around the perimeter of the exclusion zone

NA Personal Breathing Zone Monitoring on personnel conducting contaminated dust and soil removal

NA Digitally photograph each sample location and at any place field sampling personnel determined necessary

- ☒ Electronically file photo files into the on-site database
- ☒ Complete Field Documentation
  - ☒ Field Sample Data Sheets (FSDS)
  - ☒ Logbook
  - ☒ On-site computer database
- ☒ Label each sample media with a unique number
- ☒ Seal sample(s) in zip lock plastic bags
- ☒ Complete and include Chain of Custody (COC) Form required for shipping of samples to appropriate laboratory
- ☒ Package samples for transport IAW SOP 2-1, Packaging and Shipping of Environmental Samples
- ☒ Review and disseminate sample results as received from the laboratories to Project Manager and other appropriate managers and employees
- ☒ Electronically file sample reports into on-site database



## 3<sup>rd</sup> West Substation Site Project Safety Audit

Project: 3<sup>rd</sup> West Sub Station

Date: 07/11/12

Location: 3<sup>rd</sup> West, 1<sup>st</sup> South, SLC

Job Number: \_\_\_\_\_

Survey Conducted By: Justin Kargis

Title: \_\_\_\_\_

Standard	Title	In Compliance	Out of Compliance	N/A	Corrective Action Taken and Date
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1926.59	Hazard Communication Program, List of Chemicals, Training, MSDSs.			x	
1926.500 (b) & (d) (old standard)	Guardrails on open sided floors, floor holes and runways.			x	
1926.404 (b)	Ground fault circuit interrupters or an assured equipment grounding conductor program in use.	x			
1926.451 (b)	The employer shall instruct each employee in the recognition and avoidance of unsafe conditions.			x	
1926.451 (d)	Tubular welded scaffolds shall be properly braced so that they are plumb, square and rigid; legs on plumb, adjustable, mud sills, etc. to support the maximum load; guardrails and toe boards shall be installed.			x	
1926.100 (a)	Head protection, where there is a possible danger of head injury.	x			

Standard	Title	In Compliance	Out of Compliance	N/A	Corrective Action Taken and Date
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1926.652 (a) (1)	Excavation protective systems; examination by competent person when less than 5 feet in depth.			x	
1926.20 (b) (2)	Employer responsibility to initiate and maintain safety and health programs.			x	
1926.20 (b) (1)	Employer responsibility to provide for frequent and regular inspections by designated competent persons.			x	
1926.451 (e)	Manually propelled scaffolds shall have tight planking for the full width, platforms secured, ladder or stairway provided, suitable footing, stand plumbs, wheels locked, guardrails and toe boards.			x	
1926.1052 (c) (1)	Stair rail and handrail along each unprotected edge.			x	
1926.25 (a)	Debris, scrap lumber with protruding nails, not cleared for work areas, stairs and around structures.			x	
1926.50	First aid shall be available in the absence of an infirmary, or other that is reasonably accessible; first aid supplies shall be accessible and telephone numbers posted.	x			
1926.451 (a) (13)	Scaffolding safe access not provided by ladder or equivalent.			x	
1926.651 (k) (1)	Excavations, protective systems, inspected daily by a competent person and as needed.			x	
1926.403 (b) (2)	Employer shall ensure electrical equipment is free from recognized hazards, is suitable, used in accordance with the listing, labeling or certification.	x			

Standard	Title	In Compliance	Out of Compliance	N/A	Corrective Action Taken and Date
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1926.451 (a) (4)	Scaffolding shall have guardrails and toe boards when more than 10 feet high and when less than 45 inches of work space.			x	
1926.405 (g) (2)	Flexible cords shall be used without splice or tap; strain relief shall be provided.			x	
1926.405 (b)	Electrical boxes, fittings shall have covers, faceplates or canopy and holes shall be smooth where cords pass through; and unused openings in cabinets/boxes shall be closed.	x			
1926.701 (b)	Reinforcing steel onto which employees could fall shall be guarded.			x	
1926.1053 (b) (1)	Portable ladder side rails extend at least 3 feet or be secured at top.			x	
1926.651 (j) (2)	Excavations shall have materials or equipment placed at least 2 feet from the edge.			x	
1926.651 (c) (2)	Excavations shall have a safe means of egress such as ladders, ramps, etc.	x			
1926.150 (c) (1)	Portable fire fighting equipment shall be provided and extinguishers shall be inspected periodically.	x			
1926.102 (a) (1)	Eye and face protection shall be provided.	x			
1926.300 (b) (2)	Guards for power tools shall be used and moving parts of equipment shall be guarded.	x			
1926.350 (a) (9)	Oxygen cylinders in storage shall be separated from fuel gas cylinders by at least 20 feet or a 1/2 fire resistance barrier.			x	
1926.405 (a) (2) (ii) (e) & (f)	Temporary lights shall be protected from breakage, not suspended by their cords and extension cord.			X	



Standard	Title	In Compliance	Out of Compliance	N/A	Corrective Action Taken and Date
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1926.405 (a) (2) (ii) (j)	Extension cords used with portable electric tools shall be of three wire type and designed for hard or extra hard usage.	x			
1926.105 (a)	Workplaces more than 25 feet above the ground or water shall have safety nets when ladder, safety line/belts, temporary floors, scaffolds, catch platform are not practical.			x	
1926.1051 (a)	Stairway or ladder shall be provided at all access points where there is a break in elevation of 19 inches or more.			x	
1926.451 (a) (2)	Scaffolding footing or anchorage shall be sound, rigid and capable of carrying the maximum intended load.	x			
1926.500 (c) (1) (old standard)	Wall opening shall be guarded.			x	
1926.404 (f) (7)	Electrical equipment connected by cord and plug shall be grounded except if there is an isolating transformer or the tool is double insulated.	x			
1926.556 (b) (2)	When working from an aerial lift, a full body harness and lanyard attached to the boom or basket.	x			
1926.501 (b) (1) (new standard)	Guardrails, safety nets or personal fall arrest system shall be used at 6 feet or more.			x	
1926.451 (a) (14)	Scaffold planking shall extend over their end support not less than 6 inches and not more than 12 inches.			x	
1926.602 (a) (9)	Bi-directional earth moving equipment shall have audible alarms.	x			

<i>Standard</i>	<i>Title</i>	In Compliance	Out of Compliance	N/A	<i>Corrective Action Taken and Date</i>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1926.451 (a) (3)	Scaffolding shall be erected, moved, dismantled or altered under the supervision of a competent person.			x	
1926.550 (b) (2)	Cranes, crawler, truck or locomotive, shall meet the design, testing, maintenance, and operation per ANSI B30.5_1968. The most recent certification shall be on file until a new one is prepared.			x	

Comments:

CVE line crew finished work on ground grid in UTA yard and covered trenches with clean fill and new yard rock. They also began work on replacing wire buss with hard buss in bay 1. A separate line crew worked on capacitor bank equipment and assembly.

CVE electricians continued trenching and working on control cables around 46 kV yard.

Weather was hot and dry with temperatures around 100.

# 3<sup>RD</sup> WEST SUBSTATION REMEDIATION PROJECT

## HEALTH SAFETY MANAGER (HSM)

### DAILY CHECKLIST

DATE: 07/12/12

#### General

NA Work area Health and Safety Inspection

NA Review and if necessary update Activity Hazard Analyses (AHA) based on planned site activities for the day

NA Safety Planning or "Tailgate" mandatory meeting for all employees and contractors prior to commencement of any site work. Instruction, review hazards, health & safety issues and any modifications to the CSHASP

NA Site hazard and safety instruction for all first time employees, contractors or visitors

NA Complete Employee Meeting Record Form B (where applicable)

NA Document required Respirator Training completion with Form H

NA Record times and numbers of dump trucks and trailers as they leave the site with contaminated material.

NA Confirm return of waste material manifest documents for each load with site manager.

NA Complete all CSHASP Forms (for applicable activities planned for that day)

NA Illness/Injury Report Form A

NA Site-Specific Training Record Form C

NA Hot Work Permit Form D

NA Trench/Evacuation Permit Form E

NA Combined Space Entry Permit Form F

Exclusion zone operations are practiced as instructed.

NA Decontamination unit is working properly.

NA Workers are using decontamination unit as instructed.

NA Workers use personal protective equipment properly.

☒ Set air samples at cardinal compass points around exclusion zone. Check throughout the day to ensure proper operation.  
Observe control measures for dust and fugitive materials i.e. watering excavation sites and track out prevention.

☒ Review sign-in/sign-out log throughout and at the end of the workday.

☒ Secure the site at the end of the workday

#### Sampling

NA Soil Confirmation sampling for any newly excavated areas

NA Stationary Air Monitoring during contaminated soil removal around the perimeter of the exclusion zone

NA Personal Breathing Zone Monitoring on personnel conducting contaminated dust and soil removal

NA Digitally photograph each sample location and at any place field sampling personnel determined necessary

- ☒ Electronically file photo files into the on-site database
- ☒ Complete Field Documentation
  - ☒ Field Sample Data Sheets (FSDS)
  - ☒ Logbook
  - ☒ On-site computer database
- ☒ Label each sample media with a unique number
- ☒ Seal sample(s) in zip lock plastic bags
- ☒ Complete and include Chain of Custody (COC) Form required for shipping of samples to appropriate laboratory
- ☒ Package samples for transport IAW SOP 2-1, Packaging and Shipping of Environmental Samples
- ☒ Review and disseminate sample results as received from the laboratories to Project Manager and other appropriate managers and employees
- ☒ Electronically file sample reports into on-site database



## 3<sup>rd</sup> West Substation Site Project Safety Audit

Project: 3<sup>rd</sup> West Sub Station

Date: 07/12/12

Location: 3<sup>rd</sup> West, 1<sup>st</sup> South, SLC

Job Number: \_\_\_\_\_

Survey Conducted By: Justin Kargis

Title: \_\_\_\_\_

Standard	Title	In Compliance	Out of Compliance	N/A	Corrective Action Taken and Date
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1926.59	Hazard Communication Program, List of Chemicals, Training, MSDSs.			x	
1926.500 (b) & (d) (old standard)	Guardrails on open sided floors, floor holes and runways.			x	
1926.404 (b)	Ground fault circuit interrupters or an assured equipment grounding conductor program in use.	x			
1926.451 (b)	The employer shall instruct each employee in the recognition and avoidance of unsafe conditions.			x	
1926.451 (d)	Tubular welded scaffolds shall be properly braced so that they are plumb, square and rigid; legs on plumb, adjustable, mud sills, etc. to support the maximum load; guardrails and toe boards shall be installed.			x	
1926.100 (a)	Head protection, where there is a possible danger of head injury.	x			

Standard	Title	In Compliance	Out of Compliance	N/A	Corrective Action Taken and Date
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1926.652 (a) (1)	Excavation protective systems; examination by competent person when less than 5 feet in depth.			x	
1926.20 (b) (2)	Employer responsibility to initiate and maintain safety and health programs.			x	
1926.20 (b) (1)	Employer responsibility to provide for frequent and regular inspections by designated competent persons.			x	
1926.451 (e)	Manually propelled scaffolds shall have tight planking for the full width, platforms secured, ladder or stairway provided, suitable footing, stand plumbs, wheels locked, guardrails and toe boards.			x	
1926.1052 (c) (1)	Stair rail and handrail along each unprotected edge.			x	
1926.25 (a)	Debris, scrap lumber with protruding nails, not cleared for work areas, stairs and around structures.			x	
1926.50	First aid shall be available in the absence of an infirmary, or other that is reasonably accessible; first aid supplies shall be accessible and telephone numbers posted.	x			
1926.451 (a) (13)	Scaffolding safe access not provided by ladder or equivalent.			x	
1926.651 (k) (1)	Excavations, protective systems, inspected daily by a competent person and as needed.			x	
1926.403 (b) (2)	Employer shall ensure electrical equipment is free from recognized hazards, is suitable, used in accordance with the listing, labeling or certification.	x			

Standard	Title	In Compliance	Out of Compliance	N/A	Corrective Action Taken and Date
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1926.451 (a) (4)	Scaffolding shall have guardrails and toe boards when more than 10 feet high and when less than 45 inches of work space.			x	
1926.405 (g) (2)	Flexible cords shall be used without splice or tap; strain relief shall be provided.			x	
1926.405 (b)	Electrical boxes, fittings shall have covers, faceplates or canopy and holes shall be smooth where cords pass through; and unused openings in cabinets/boxes shall be closed.	x			
1926.701 (b)	Reinforcing steel onto which employees could fall shall be guarded.			x	
1926.1053 (b) (1)	Portable ladder side rails extend at least 3 feet or be secured at top.			x	
1926.651 (j) (2)	Excavations shall have materials or equipment placed at least 2 feet from the edge.			x	
1926.651 (c) (2)	Excavations shall have a safe means of egress such as ladders, ramps, etc.	x			
1926.150 (c) (1)	Portable fire fighting equipment shall be provided and extinguishers shall be inspected periodically.	x			
1926.102 (a) (1)	Eye and face protection shall be provided.	x			
1926.300 (b) (2)	Guards for power tools shall be used and moving parts of equipment shall be guarded.	x			
1926.350 (a) (9)	Oxygen cylinders in storage shall be separated from fuel gas cylinders by at least 20 feet or a ½ fire resistance barrier.			x	
1926.405 (a) (2) (ii) (e) & (f)	Temporary lights shall be protected from breakage, not suspended by their cords and extension cord.			X	

Standard	Title	In Compliance	Out of Compliance	N/A	Corrective Action Taken and Date
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1926.405 (a) (2) (ii) (j)	Extension cords used with portable electric tools shall be of three wire type and designed for hard or extra hard usage.	x			
1926.105 (a)	Workplaces more than 25 feet above the ground or water shall have safety nets when ladder, safety line/belts, temporary floors, scaffolds, catch platform are not practical.			x	
1926.1051 (a)	Stairway or ladder shall be provided at all access points where there is a break in elevation of 19 inches or more.			x	
1926.451 (a) (2)	Scaffolding footing or anchorage shall be sound, rigid and capable of carrying the maximum intended load.	x			
1926.500 (c) (1) (old standard)	Wall opening shall be guarded.			x	
1926.404 (f) (7)	Electrical equipment connected by cord and plug shall be grounded except if there is an isolating transformer or the tool is double insulated.	x			
1926.556 (b) (2)	When working from an aerial lift, a full body harness and lanyard attached to the boom or basket.	x			
1926.501 (b) (1) (new standard)	Guardrails, safety nets or personal fall arrest system shall be used at 6 feet or more.			x	
1926.451 (a) (14)	Scaffold planking shall extend over their end support not less than 6 inches and not more than 12 inches.			x	
1926.602 (a) (9)	Bi-directional earth moving equipment shall have audible alarms.	x			



Standard	Title	In Compliance	Out of Compliance	N/A	Corrective Action Taken and Date
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1926.451 (a) (3)	Scaffolding shall be erected, moved, dismantled or altered under the supervision of a competent person.			x	
1926.550 (b) (2)	Cranes, crawler, truck or locomotive, shall meet the design, testing, maintenance, and operation per ANSI B30.5_1968. The most recent certification shall be on file until a new one is prepared.			x	

Comments:

CVE line crew continued working on replacing wire buss with hard buss in bay 1. Line crew departed for the day around 2 pm.

CVE electricians continued trenching and working on control cables around 46 kV yard.

RMP relay technicians have been on site throughout the week.

Weather was hot and dry with temperatures around 100.



PHOTO 1

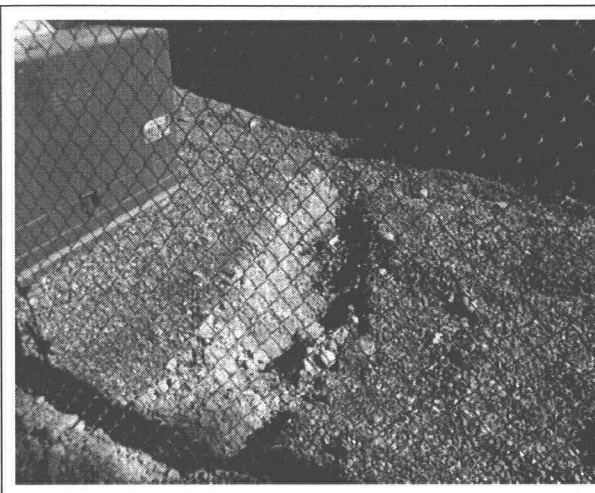


PHOTO 2

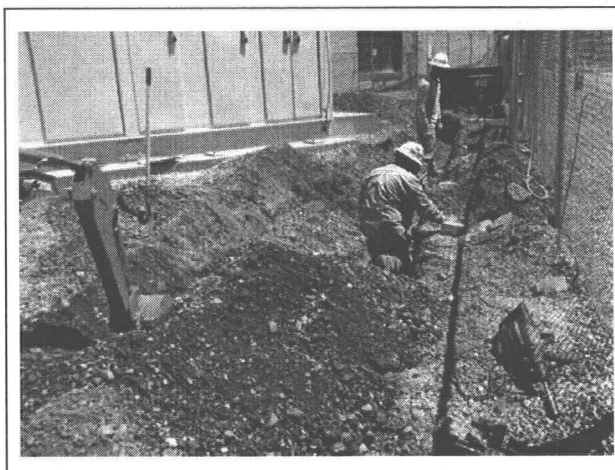


PHOTO 3

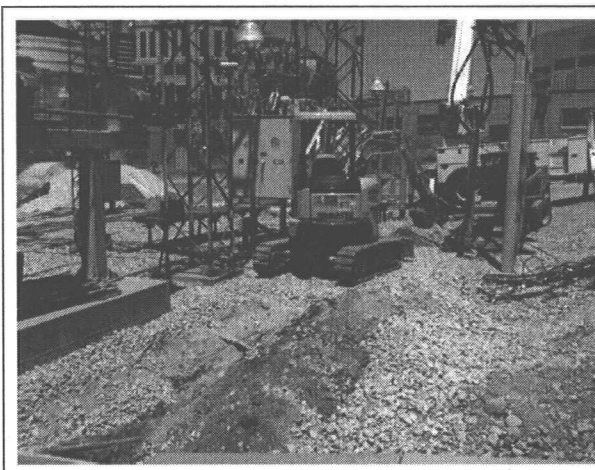


PHOTO 4

## **R & REnvironmental, Inc.**

47 West 9000 South, Suite #2, Sandy, Utah 84070  
(801) 352-2380 • Fax: (801) 352-2381

PROJECT NO:

DESIGNED BY:

SCALE:

REVIEWED BY:

DCR

DRAWN BY:

JMK

DATE

07/09/12

FILE:

## **SITE PHOTOGRAPHS**



**3<sup>rd</sup> West Substation**  
**"2011 Upgrade Project"**  
**Salt Lake City, Utah**

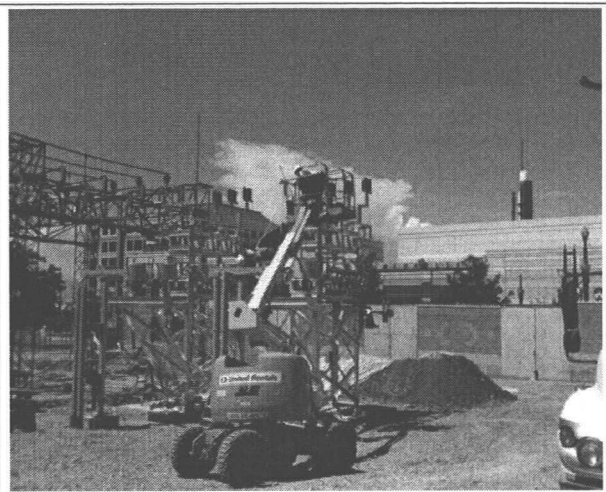


PHOTO 1



PHOTO 2



PHOTO 3

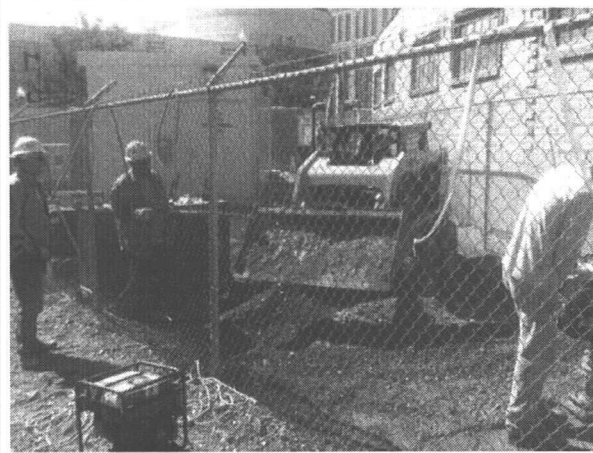


PHOTO 4

## **R & R**Environmental, Inc.

47 West 9000 South, Suite #2, Sandy, Utah 84070  
(801) 352-2380 • Fax: (801) 352-2381

PROJECT NO:

DESIGNED BY:

SCALE:

REVIEWED BY:  
DCR

DRAWN BY:  
JMK

DATE  
07/10/12

FILE:

## SITE PHOTOGRAPHS



3<sup>rd</sup> West Substation  
"2011 Upgrade Project"  
Salt Lake City, Utah

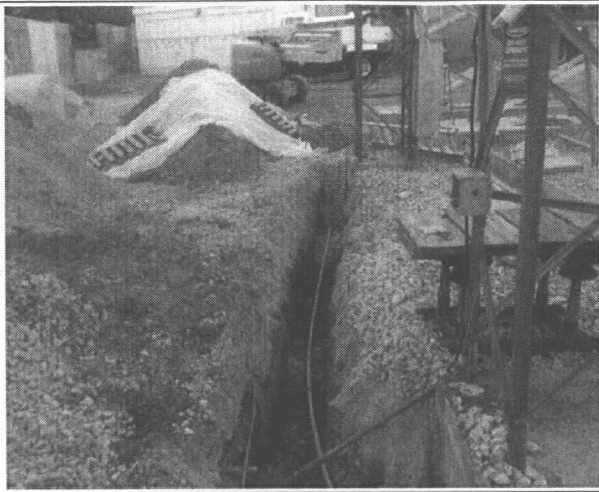


PHOTO 1

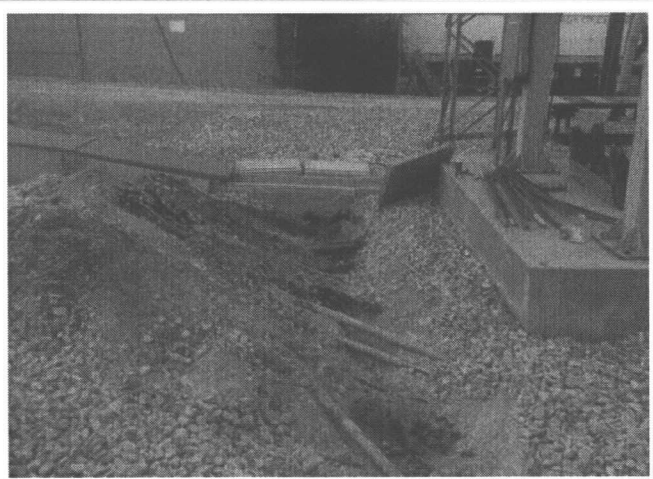


PHOTO 2

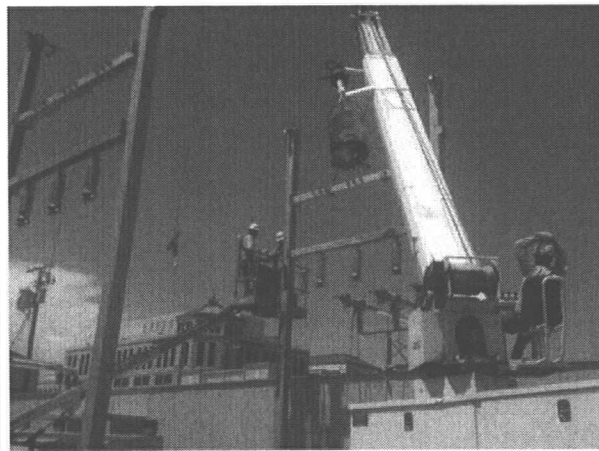


PHOTO 3

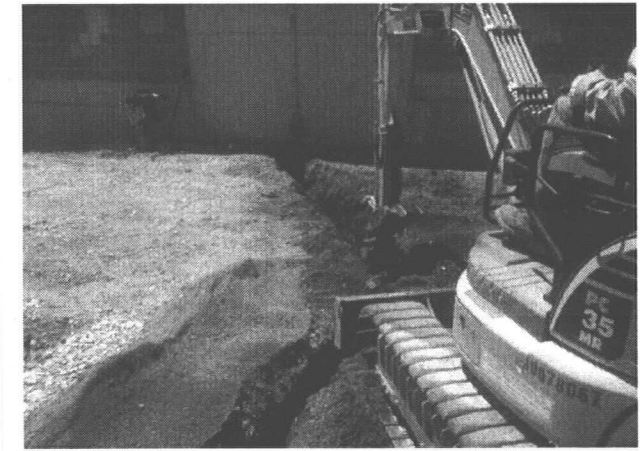


PHOTO 4

## **R & R**Environmental, Inc.

47 West 9000 South, Suite #2, Sandy, Utah 84070  
(801) 352-2380 • Fax: (801) 352-2381

PROJECT NO:

DESIGNED BY:

SCALE:

REVIEWED BY:  
DCR

DRAWN BY:  
JMK

DATE  
07/11/12

FILE:

## SITE PHOTOGRAPHS



3<sup>rd</sup> West Substation  
"2011 Upgrade Project"  
Salt Lake City, Utah

# PACIFICORP OPERATIONS - Field Construction Representative Daily Log

PROJECT NAME: Third West Sub - Rebuild

DATE : Monday, July 9, 2012

PO & Work Order NO. : 3000078050 / 10035803

MAIN CONTRACTOR : Cache Valley Electric

Crew Start Time: 6:55

Crew Stop Time: 17:10

Tot Hrs mns: 10:15

FCR Start Time: 6:45

FCR Stop Time: 17:15

Tot Hrs mns: 10:30

Use military time format 00:00

WEATHER CONDITIONS: Sunny - 77 degrees in AM, 100 degrees in PM

**DESCRIPTION: (work performed, general comments, instructions to contractor, # of crew members onsite.)**

R&R set up four monitors. CVE Line Crew is working on completing the grounding in the UTA yard and on erecting the capacitor banks. Got the two capacitors stacked and will be piping them in on Tuesday. Still working on the UTA ground grid. CVE Fab Crew is not on site today. CVE Electrician Crew arrived around 10:00. They worked on conduit trenches for the yard lighting. Newman is not on site today. CVE Line Crew = 6, CVE Fab Crew = 0, CVE Electrical Crew = 3, Newman = 0, R&R = 1.

**IF WORKING IN ENERGIZED SUBSTATION:**

Dispatcher login, name and time: Bob Gentry - 0645

Dispatcher logout name and time: Al Swinski - 1720

**DISCREPANCIES:**

**IMMEDIATE CORRECTIVE ACTION TAKEN:**


**DELAYS OR LOST TIME ENCOUNTERED:**

--

**EQUIPMENT (working, delivered, idle):**

CVE Line Crew: Portable toilet (2), forklift, 1 dumpster, office trailer, conex, exclusion zone conex (2), tool trailer, Pickup, JLG (1), tool trailer Newman: trachoe (1), bobcat, mini-ex, water truck, compactor, backhoe.

**OSHA Recordable Safety Incidents:**

Reported by:

Time:


**Rocky Mountain Power**

A division of PacifiCorp

Russ Johnson

Field Construction Representative

# PACIFICORP OPERATIONS - Field Construction Representative Daily Log

PROJECT NAME: Third West Sub - Rebuild

DATE : Tuesday, July 10, 2012

PO & Work Order NO. : 3000078050 / 10035803

MAIN CONTRACTOR : Cache Valley Electric

Crew Start Time: 6:55

Crew Stop Time: 17:00

Tot Hrs mns: 10:05

FCR Start Time: 6:55

FCR Stop Time: 17:15

Tot Hrs mns: 10:20

Use military time format 00:00

WEATHER CONDITIONS: Sunny - 73 degrees in AM, 102 degrees in PM

## DESCRIPTION: (work performed, general comments, instructions to contractor, # of crew members onsite.)

R&R set up four monitors. Kevin Freestone dropped by the sub around 4:30 for a quick visit. Scott Collard came by to discuss punch list items. CVE Line Crew completed the ground grid work in the UTA yard. They now need to place the yard finish rock. They continued erecting the capacitor banks and should finish the bus work on Wednesday. CVE Fab Crew is not on site today. CVE Electrician is working with the line crew piping the capacitors. Newman is not on site today. CVE Line Crew = 7, CVE Fab Crew = 0, CVE Electrical Crew = 1, Newman = 0, R&R = 1.

## IF WORKING IN ENERGIZED SUBSTATION:

Dispatcher login, name and time: Jim Bowman - 00654

Dispatcher logout, name and time: Gus Montanez - 17:15

## DISCREPANCIES:

7/10/12 - Identified conflict on bus size for jumpers from the 12 kv capacitor cables to the cap banks

## IMMEDIATE CORRECTIVE ACTION TAKEN:

Roger Fuerst confirmed that we should install 336 AAC, not the 4/0 called for on the BOM

## DELAYS OR LOST TIME ENCOUNTERED:

## EQUIPMENT (working, delivered, idle):

CVE Line Crew: Portable toilet (2), forklift, 1 dumpster, office trailer, conex, exclusion zone conex (2), tool trailer, Pickup, JLG (1), tool trailer. Newman: trachoe (1), bobcat, mini-ex, water truck, compactor, backhoe.

## OSHA Recordable Safety Incidents:

Reported by:

Time:

**Rocky Mountain Power**

A division of PacifiCorp

Russ Johnson

Field Construction Representative

# PACIFICORP OPERATIONS - Field Construction Representative Daily Log

PROJECT NAME: Third West Sub - Rebuild

DATE : Wednesday, July 11, 2012

PO & Work Order NO. : 3000078050 / 10035803

MAIN CONTRACTOR : Cache Valley Electric

Crew Start Time: 6:55

Crew Stop Time: 17:10

Tot Hrs mns: 10:15

FCR Start Time: 6:39

FCR Stop Time: 16:15

Tot Hrs mns: 9:36

Use military time format 00:00

WEATHER CONDITIONS: Sunny - 79 degrees in AM, 103 degrees in PM

**DESCRIPTION: (work performed, general comments, instructions to contractor, # of crew members onsite.)**

R&R set up four monitors. CVE Line Crew completed the ground grid work in the UTA yard and placed yard finish rock in same. They completed the install of the capacitor banks with the exception of the jumper from the cap banks to the terminators, which are yet to be installed. After lunch, the line crew started wrecking out the 12 kV bus from Xfmr #1 to the switchgear and swapped out the beams, top to bottom, for the new bus configuration. CVE Fab Crew is not on site today. CVE Electrician worked with the line crew piping the capacitors and then began excavating for the yard lights along the west wall and for the conduit run from the wall to the cable trench. Newman is not on site today. CVE Line Crew = 7, CVE Fab Crew = 0, CVE Electrical Crew = 1, Newman = 0, R&R = 1.

**IF WORKING IN ENERGIZED SUBSTATION:**

Dispatcher login, name and time: Manny LuHaun - 0639

Dispatcher logout, name and time: 1 left early and contractor didn't call in

**DISCREPANCIES:**

**IMMEDIATE CORRECTIVE ACTION TAKEN:**


**DELAYS OR LOST TIME ENCOUNTERED:**

--

**EQUIPMENT (working, delivered, idle):**

CVE Line Crew: Portable toilet (2), forklift, 1 dumpster, office trailer, conex, exclusion zone conex (2), tool trailer, Pickup, JLG (1), tool trailer. Newman: trachoe (1), bobcat, mini-ex, water truck, compactor, backhoe.

**OSHA Recordable Safety Incidents:**

Reported by:

Time:

--	--	--

**Rocky Mountain Power**

A division of PacifiCorp

Russ Johnson

Field Construction Representative

# PACIFICORP OPERATIONS - Field Construction Representative Daily Log

PROJECT NAME: Third West Sub - Rebuild

DATE : Thursday, July 12, 2012

PO & Work Order NO. : 3000078050 / 10035803

MAIN CONTRACTOR : Cache Valley Electric

Crew Start Time: 6:55

Crew Stop Time: 16:30

Tot Hrs mns: 9:35

FCR Start Time: 6:43

FCR Stop Time: 16:35

Tot Hrs mns: 9:52

Use military time format 00:00

WEATHER CONDITIONS: Sunny - 80 degrees in AM, degrees in PM

**DESCRIPTION: (work performed, general comments, instructions to contractor, # of crew members onsite.)**

R&R set up four monitors. CVE Line Crew is working on the 12 kV bus mods between Xfmr #1 and the switchgear. It is necessary to redrill the holes for mounting the insulators to allow for the angle between the two bus structures and to get the bus supports to line up. CVE was able to reuse the jumpers to both the Xfmr and the switchgear. They had to press new tenninals on one end only. They completed the install of the 12 kV bus with the exception of the bird guard. CVE Fab Crew is not on site today. CVE Electrician pulled wiring for the yard lights and installed conduits for same. Newman is not on site today but will return on Monday and start hauling the material to Clean Harbors. CVE Line Crew = 7, CVE Fab Crew = 0, CVE Electrical Crew = 1, Newman = 0, R&R = 1.

**IF WORKING IN ENERGIZED SUBSTATION:**

Dispatcher login, name and time: Manny LuHaun - 0643

Dispatcher logout, name and time: Gus Montanez - 1633

**DISCREPANCIES:**

**IMMEDIATE CORRECTIVE ACTION TAKEN:**


**DELAYS OR LOST TIME ENCOUNTERED:**

--

**EQUIPMENT (working, delivered, idle):**

CVE Line Crew: Portable toilet (2), forklift, 1 dumpster, office trailer, conex, exclusion zone conex (2), tool trailer, Pickup, JLG (1), tool trailer. Newman: trachoe (1), bobcat, mini-ex, water truck, compactor, backhoe.

**OSHA Recordable Safety Incidents:**

Reported by:

Time:


**Rocky Mountain Power**

A division of PacifiCdrp

Russ Johnson

Field Construction Representative





# **Reservoirs Environmental, Inc.**

July 16, 2012

Laboratory Code: RES  
Subcontract Number: NA  
Laboratory Report: RES 239873-1R  
Project # / P.O. #: None Given  
Project Description: 3rd West Sub - RMP

Eldon Romney  
R & R Environmental  
47 West 9000 South #2  
Sandy UT 84070

Dear Customer,

Reservoirs Environmental, Inc. is an analytical laboratory accredited for the analysis of Industrial Hygiene and Environmental matrices by the National Voluntary Laboratory Accreditation Program (NVLAP), Lab Code 101896-0 for Transmission Electron Microscopy (TEM) and Polarized Light Microscopy (PLM) analysis and the American Industrial Hygiene Association (AIHA), Lab ID 101533 - Accreditation Certificate #480 for Phase Contrast Microscopy (PCM) analysis. This laboratory is currently proficient in both Proficiency Testing and PAT programs respectively.

Reservoirs Environmental, Inc. has analyzed the following samples for asbestos content as per your request. The analysis has been completed in general accordance with the appropriate methodology as stated in the attached analysis table. The results have been submitted to your office.

RES 239873-1R is the job number assigned to this study. This report is considered highly confidential and the sole property of the customer. Reservoirs Environmental, Inc. will not discuss any part of this study with personnel other than those of the client. The results described in this report only apply to the samples analyzed. This report must not be used to claim endorsement of products or analytical results by NVLAP or any agency of the U.S. Government. This report shall not be reproduced except in full, without written approval from Reservoirs Environmental, Inc. Samples will be disposed of after sixty days unless longer storage is requested. If you have any questions about this report, please feel free to call 303-964-1986.

Sincerely,

Jeanne Spencer  
President

# RESERVOIRS ENVIRONMENTAL, INC.

NVLAP Lab Code 101896-0; TDH: #30-0015

TABLE I. TEM AIR FILTER SAMPLE DATA AND ANALYTICAL RESULTS

RES Job Number: RES 239873-1R  
Client: R & R Environmental  
Client Project Number / P.O.: None Given  
Client Project Description: 3rd West Sub - RMP  
Date Samples Received: July 11, 2012  
Analysis Type: TEM, AHERA  
Turnaround: 24 Hour  
Date Samples Analyzed: July 11, 2012

Client ID Number	Lab ID Number	Area Analyzed (mm <sup>2</sup> )	Air Volume Sampled (L)	Number of Asbestos Structures Detected	Analytical Sensitivity (s/cc)	Asbestos Concentration (s/cc)	Filter Loading (s/mm <sup>2</sup> )
3W-070912 E	EM 891601	0.1000	812	1	0.0047	0.0047	10.0
3W-070912 N	EM 891602	0.1000	812	ND	0.0047	BAS	BAS
3W-070912 W	EM 891603	0.1000	814	ND	0.0047	BAS	BAS
3W-070912 S	EM 891604	0.1000	815	ND	0.0047	BAS	BAS

NA = Not Analyzed  
ND = None Detected  
BAS = Below Analytical Sensitivity  
Average Grid Opening in mm<sup>2</sup> = 0.010

Filter Material = Mixed Cellulose Ester  
Filter Diameter = 25 mm  
Effective Filter Area = 385 sq mm

 Digitally signed by  
Gina Verrano  
Date  
2012.07.18  
15:35:14  
0000

DATA QA

**RESERVOIRS ENVIRONMENTAL, INC.**  
NVLAP Lab Code 101896-0; TDH: #30-0016

**TABLE II. SUMMARY OF ANALYTICAL DATA**

RES Job Number: RES 239873-1R  
Client: R & R Environmental  
Client Project Number / P.O.: None Given  
Client Project Description: 3rd West Sub - RMP  
Date Samples Received: July 11, 2012  
Analysis Type: TEM, AHERA  
Turnaround: 24 Hour  
Date Samples Analyzed: July 11, 2012

Client ID Number	Lab ID Number	Asbestos Mineral	Asbestos Structure Types*				Structures >5 Microns in Length	**Excluded Structures	Asbestos Structures for Concentration
			Fibers	Bundles	Clusters	Matrices			
3W-070912 E	EM 891601	Chrysotile	1	0	0	0	0	0	1
3W-070912 N	EM 891602	ND	0	0	0	0	0	0	0
3W-070912 W	EM 891603	ND	0	0	0	0	0	0	0
3W-070912 S	EM 891604	ND	0	0	0	0	0	0	0

\*See Analytical Procedure for definitions

\*\*C = Excluded from total due to lack of confirmation

\*\*L = Excluded from total for length less than 0.5 micron (AHERA only)

\*\*A = Excluded from total due to incorrect aspect ratio

ND = None Detected

Due Time: 9:25

 **Reservoirs Environmental, Inc.**

8801 Logan St. Denver, CO 80216 • Ph: 303 964-1888 • Fax 303 477-4275 • Toll Free 866 RES-LENY

**Pagar : 303-509-2008**

**INVOICE TO: (IF DIFFERENT)****CONTACT INFORMATION:**

Company: <b>RFR Environmental</b>	Company:	Contact: <b>Dave Rostkelly</b>	Contact:
Address:	Address:	Pho to:	Phone:
		Fax:	Fax:
		Cell/pager: <b>801 541-1035</b>	Cell/pager:
Project Number and/or P.O. #:		Final Data Delivered via Email Address:	
Project Description/Location: <b>47 W 91900 S #2</b>		<b>dave@renviro.com</b>	

[illegible]

Number of samples received: 14 (Additional samples shall be listed on attached long form.)

NOTE: REI will analyze incoming samples based upon information received and will not be responsible for errors or omissions in calculations resulting from the inaccuracy of original data. By signing this company representative agrees that submission of the following samples for requested analysis as indicated on this Chain of Custody form constitute an analytical services agreement with payment terms of NET 30 days, failure to comply with payment terms may result in a 1.5% monthly interest surcharge.

Relinquished By: <u>Justin K...</u> <u>FedEx</u> Date/Time: <u>7/09/12</u>										Sample Condition:		On Ice		Sealed		Infect						
Laboratory Use Only										Temp. (F°)		Yes / No		Yes / No		Yes / No						
Received By: <u>Justin K...</u> Date/Time: <u>7.11.12</u> <u>2:22</u> Carrier: <u>FedEx</u>																						
Results:	Contact	<u>Dave</u>	Phone	Email	Fax	Date	<u>7/11</u>	Time	<u>8:45P</u>	Initials	<u>TK</u>	Contact		Phone	Email	Fax	Date	<u>7/12</u>	Time	<u>8:00P</u>	Initials	<u>JK</u>
	Contact		Phone	Email	Fax	Date		Time		Initials		Contact		Phone	Email	Fax	Date		Time		Initials	

7937 4834 5336

## Attachment I

### Key to Count Sheets Count Sheets Analytical Procedures

Structures identifications consist of an Asbestos Type followed by a Structure Type

#### Asbestos Type

A = Amosite  
An = Anthophyllite  
C = Chrysotile  
Cr = Crocidolite  
T = Tremolite

#### Structure Types

F = Fiber  
B = Bundle  
C = Cluster  
M = Matrix

ND = no structures detected  
M = other structure associated with a matrix  
NAM = Non Asbestos Mineral  
XGB = partly obscured by a grid bar

#### Sizing Conversion

1 length unit = 5 mm on screen = 0.278 micron

1.80 length units = 0.5 micron

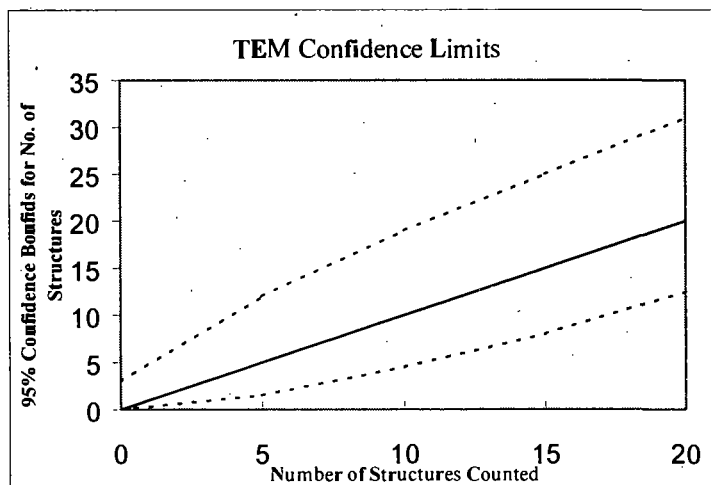
18.0 length units = 5 microns

1 width unit = 1 mm on screen = 0.0556 micron

#### TEM Analysts

Jeanne S. Orr  
Nathan DelHierro  
Angela Heitger  
Jonathan Bernard

Paul D. LoScalzo  
Mark Steiner  
Norberto Zimbleman  
Robert Workman



Upper and lower 95% confidence bounds for the number of structures counted assuming a Poisson distribution.

Reservoirs Environmental, Inc.  
TEM Asbestos Structure Count

Laboratory name:	Reservoirs Environmental, Inc.
Instrument	JEOL 100 CX (N) (S)
Voltage (KV)	100 KV
Magnification	20KX 10KX
Grid opening area (mm <sup>2</sup> )	0.010
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	
QA Type	

Client:	R+R
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm <sup>2</sup> )	812
Date received by lab	7/11/12
Lab Job Number:	239873
Lab Sample Number:	891601

Analyzed by	TK
Analysis date	7/11/12
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting rules (ISO, ANERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

## F-Factor Calculation (Indirect Preps Only):

Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	Width		Amphibole	C	NAM		Sketch	Photo	EDS
A	H3-3	ND												
	G3-3	ND												
	F3-3	ND												
	E3-3	ND												
	E3-4	ND												
B	H5-1	ND												
	G5-1	F		1	2	1	cm		-		1			
	F5-1	ND												
	F6-4	ND												
	E6-4	ND												

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Reservoirs Environmental, Inc.  
TEM Asbestos Structure Count

Laboratory name:	Reservoirs Environmental, Inc.
Instrument	JEOL 100 CX (N) <u>S</u>
Voltage (KV)	100 KV
Magnification	<u>20KX</u> 10KX
Grid opening area (mm <sup>2</sup> )	0.010
Scale: 1L =	0.28 $\mu$ m
Scale: 1D =	0.056 $\mu$ m
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	
QA Type	

Client:	<u>R+P</u>
Sample Type (A=Air, D=Dust):	<u>A</u>
Air volume (L) or dust area (cm <sup>2</sup> )	<u>812</u>
Date received by lab	<u>7/11/12</u>
Lab Job Number:	<u>239873</u>
Lab Sample Number:	<u>891602</u>

Analyzed by	<u>W</u>
Analysis date	<u>7/11/12</u>
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	<u>D</u>
Counting miles (ISO, AHERA, ASTM)	<u>AH</u>
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

## F-Factor Calculation (Indirect Preps Only):

Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	Width		Amphibole	C	NAM		Sketch	Photo	EDS
<u>A</u>	<u>F4-3</u>	<u>NO</u>												
	<u>E4-3</u>	<u>NO</u>			<u>Prep A STD method 52 debris</u>									
	<u>C4-3</u>	<u>NO</u>												
	<u>F4-1</u>	<u>NO</u>			<u>Prep B ~ A</u>									
	<u>E4-1</u>	<u>NO</u>												
<u>B</u>	<u>F3-3</u>	<u>NO</u>												
	<u>E3-3</u>	<u>NO</u>												
	<u>C3-3</u>	<u>NO</u>												
	<u>C3-4</u>	<u>NO</u>												
	<u>B3-4</u>	<u>NO</u>												

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Reservoirs Environmental, Inc.  
TEM Asbestos Structure Count

Laboratory name:	Reservoirs Environmental, Inc.
Instrument	JEOL 100 CX (N) (S)
Voltage (KV)	100 KV
Magnification	20KX 10KX
Grid opening area (mm <sup>2</sup> )	0.010
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	
QA Type	

Client :	R+P
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm <sup>2</sup> )	814
Date received by lab	7/11/12
Lab Job Number	239873
Lab Sample Number	891603

## F-Factor Calculation (Indirect Preps Only):

Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Analyzed by	TK
Analysis date	7/11/12
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	Width		Amphibole	C	NAM		Sketch	Photo	EDS
A	K2-3	ND												
	H2-3	ND					Prnc A 50% intact 5% debris							
	H3-1	ND												
	G3-1	ND					Prnc B ~60% intact 5% debris							
	E2-6	ND												
B	H3-4	ND												
	G3-4	ND												
	F3-4	ND												
	E3-4	ND												
	E3-3	ND												

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material



Reservoirs Environmental, Inc.  
TEM Asbestos Structure Count

Laboratory name:	Reservoirs Environmental, Inc.
Instrument	JEOL 100 CX (N) (S)
Voltage (KV)	100 KV
Magnification	20KX 10KX
Grid opening area (mm <sup>2</sup> )	0.010
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	
QA Type	

Client:	R+P
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm <sup>2</sup> )	815
Date received by lab	7/11/12
Lab Job Number:	239873
Lab Sample Number:	891604

Analyzed by	YK
Analysis date	7/11/12
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting miles (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

## F-Factor Calculation (Indirect Preps Only):

Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	Width		Amphibole	C	NAM		Sketch	Photo	EDS
A	F2-3	ND												
	E2-3	ND												
	C2-3	ND												
	B2-3	ND												
	A3-4	ND												
B	E2-6	ND												
	C2-6	ND												
	B2-6	ND												
	A2-6	ND												
	A3-4	ND												

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

## Analytical Procedures – AHERA

Transmission electron microscopy/energy dispersive X-ray spectrometry/selected area electron diffraction (TEM/EDX/SAED) was employed in the analysis of the samples, which were collected on 25 mm mixed cellulose ester air filters. A portion of each filter was collapsed with acetone and etched in a plasma asher. The etched filter was then coated with a thin layer of carbon in a carbon side down. The sample was then placed inside a condensation washer and treated with acetone to remove the filter matrix and expose any inert material.

For each sample, enough grid openings on a 200 mesh TEM grid are analyzed to ensure an analytical sensitivity of at least 0.005 structures/cc. A minimum of four grid openings from two preparations are analyzed for each sample. The grid openings are searched for fibrous structures which, if present are analyzed by SAED and/or EDX (elemental analysis). The AHERA protocol requires SAED confirmation of enough chrysotile asbestos structures on each sample to cause the sample to exceed 70 structures/mm<sup>2</sup> (usually 4 or 5 structures). Both SAED and EDX confirmation are required of enough amphibole structures on each sample to cause the sample to exceed 70 structures/mm<sup>2</sup> (usually 4 or 5 structures) per sample. Either SAED or EDX is required for the remaining asbestos structures of either type. The morphology of each structure is determined and the length and the diameter of any asbestos structures are recorded. Asbestos fibers, bundles, cluster and matrices were identified and recorded. The asbestos structures have been defined in AHERA as follows:

<b>Fiber:</b>	is a structure having a minimum length greater than or equal to 0.5 micron with an aspect ratio of 5:1 or greater with substantially parallel sides.
<b>Bundle:</b>	is a structure composed of three or more fibers in parallel arrangement, with each fiber closer than the diameter of one fiber.
<b>Cluster:</b>	is a structure with fibers in random arrangements such that all fibers are intermixed and no single fiber is isolated from the group.
<b>Matrix:</b>	is a fiber or fibers with one end free and the other end embedded or hidden by a particulate. The exposed fiber end must meet the fiber definition given above.

If more than 50 asbestos structures are identified and confirmed on a sample, AHERA analysis may be terminated after completion of the grid opening, which contains the 50<sup>th</sup> structure. AHERA protocol requires the laboratory to reject any clearance sample which contains in excess of 25% total particulate loading or which appears to be unevenly loaded.

The AHERA protocol includes specific sampling requirements, including minimum numbers of samples and minimum air volumes. Specifically, the 70 structures/mm<sup>2</sup> clearance criteria is only allowed for sets five inside samples (collected in a group of 13 samples including: five outsides and three blanks) with volumes greater than 1200 liters (40 CFR Part 763, page 41894). Deviation from the AHERA sampling protocol may affect the validity of the analytical results. Analysis of samples collected by non-protocol methods are not accredited by NVLAP

### Equations Used for Calculations

$$\text{Area Analyzed, mm}^2 = \# \text{ GO counted} \times \text{Average GO Area (mm)}$$

$$\text{Concentration, s/cc} = \frac{\# \text{ Asbestos Structures}}{\# \text{ GO Counted}} \times \frac{1}{\text{Volume (L)}} \times \frac{\text{Eff. Filter Area (mm}^2\text{)}}{\text{Average GO area (mm}^2\text{)}} \times \frac{1\text{L}}{1000\text{cc}}$$

$$\text{Filter loading, s/mm}^2 = \frac{\# \text{ Asbestos structures}}{\text{Area Analyzed (mm}^2\text{)}}$$

GO = TEM grid opening



July 13, 2012

Laboratory Code: RES  
Subcontract Number: NA  
Laboratory Report: RES 239991-1  
Project # / P.O. #: None Given  
Project Description: 3rd West Sub - RMP

David Roskelley  
R & R Environmental  
47 West 9000 South #2  
Sandy UT 84070

Dear Customer,

Reservoirs Environmental, Inc. is an analytical laboratory accredited for the analysis of Industrial Hygiene and Environmental matrices by the National Voluntary Laboratory Accreditation Program (NVLAP), Lab Code 101896-0 for Transmission Electron Microscopy (TEM) and Polarized Light Microscopy (PLM) analysis and the American Industrial Hygiene Association (AIHA), Lab ID 101533 - Accreditation Certificate #480 for Phase Contrast Microscopy (PCM) analysis. This laboratory is currently proficient in both Proficiency Testing and PAT programs respectively.

Reservoirs Environmental, Inc. has analyzed the following samples for asbestos content as per your request. The analysis has been completed in general accordance with the appropriate methodology as stated in the attached analysis table. The results have been submitted to your office.

RES 239991-1 is the job number assigned to this study. This report is considered highly confidential and the sole property of the customer. Reservoirs Environmental, Inc. will not discuss any part of this study with personnel other than those of the client. The results described in this report only apply to the samples analyzed. This report must not be used to claim endorsement of products or analytical results by NVLAP or any agency of the U.S. Government. This report shall not be reproduced except in full, without written approval from Reservoirs Environmental, Inc. Samples will be disposed of after sixty days unless longer storage is requested. If you have any questions about this report, please feel free to call 303-964-1986.

Sincerely,

A handwritten signature in cursive script, appearing to read "Jeanne Spencer", is written over a horizontal line.

Jeanne Spencer  
President

# RESERVOIRS ENVIRONMENTAL, INC.

NVLAP Lab Code 101896-0; TDH: #30-0015

TABLE I. TEM AIR FILTER SAMPLE DATA AND ANALYTICAL RESULTS

RES Job Number: RES 239991-1  
Client: R & R Environmental  
Client Project Number / P.O.: None Given  
Client Project Description: 3rd West Sub - RMP  
Date Samples Received: July 12, 2012  
Analysis Type: TEM, AHERA  
Turnaround: 24 Hour  
Date Samples Analyzed: July 13, 2012

Client ID Number	Lab ID Number	Area Analyzed (mm <sup>2</sup> )	Air Volume Sampled (L)	Number of Asbestos Structures Detected	Analytical Sensitivity (s/cc)	Asbestos Concentration (s/cc)	Filter Loading (s/mm <sup>2</sup> )
3W-071012 E	EM 891912	0.0800	979	ND	0.0049	BAS	BAS
3W-071012 N	EM 891913	0.0800	979	ND	0.0049	BAS	BAS
3W-071012 W	EM 891914	0.0800	979	ND	0.0049	BAS	BAS
3W-071012 S	EM 891915	0.0800	977	ND	0.0049	BAS	BAS

NA = Not Analyzed  
ND = None Detected  
BAS = Below Analytical Sensitivity  
Average Grid Opening in mm<sup>2</sup> = 0.010

Filter Material = Mixed Cellulose Ester  
Filter Diameter = 25 mm  
Effective Filter Area = 385 sq mm

AC

DATA QA

Due Date: 7.13.12  
Due Time: 830a

RES 239991

**REILAB Reservoirs Environmental, Inc.**  
5801 Logan St. Denver, CO 80216 • Ph: 303 964-1000 • Fax 303 477-4275 • Toll Free 866 RES-ENV  
Pager: 303-808-2098

INVOICE TO: (IF DIFFERENT)

CONTACT INFORMATION:

Company: <u>REIL Environmental</u>	Company:	Contact: <u>Dave Roskelley</u>	Contact:
Address: <u>47 W 9600 S #2</u>	Address:	Phone:	Phone:
<u>Sandy Ut. 84070</u>		Fax:	Fax:
		Cell/pager: <u>801 541-035</u>	Cell/pager:
Project Number and/or P.O. #:		Print Direct Deliverable Email Address:	
Project Description/Location: <u>3rd West Sub - RMP</u>		<u>clive@reservoirs.com</u>	

ASBESTOS LABORATORY HOURS: Weekdays: 7am - 7pm		REQUESTED ANALYSIS												VALID MATRIX CODES				LAB NOTES:						
PLM / PCM / TEM <u>  </u> RUSH (Same Day) <u>X</u> PRIORITY (Next Day) <u>  </u> STANDARD (Rush PCM = 2hr, TEM = 6hr.)		PLM - Short report, Point Count	TEM - AHERA Level II, 7402, ISO, +/-, Quant, Semi-quant, Micro-vac, ISO-Indirect Preps	PCM - 7400A, 7400B, OSHA	DUST - Total, Respirable	METALS - Analyte(s)	RCRA 8, TCLP, Welding Fume, Metals Scan	ORGANICS - METH	Salmonella: +/-	E.coli O157:H7: +/-	Listeria: +/-	Acrobic Plate Count: +/- or Quantification	E.coli: +/- or Quantification	Coliforms: +/- or Quantification	S.aureus: +/- or Quantification	Y & M: +/- or Quantification	Mold: +/-, Identification, Quantification	Sample Volume (L) / Area		Matrix Code	# Containers	Date Collected mm/dd/yy	Time Collected hh:mm ap	EM Number (Laboratory Use Only)
CHEMISTRY LABORATORY HOURS: Weekdays: 8am - 5pm																								
Metal(s) / Oust <u>  </u> RUSH <u>  </u> 24 hr. <u>  </u> 3-5 Day																								
RCRA 8 / Metals & Welding Fume Scan / TCLP <u>  </u> RUSH <u>  </u> 5 day <u>  </u> 10 day																								
Organics <u>  </u> 24 hr. <u>  </u> 3 day <u>  </u> 5 Day																								
MICROBIOLOGY LABORATORY HOURS: Weekdays: 9am - 6pm																								
E.coli O157:H7, Coliforms, S.aureus <u>  </u> 24 hr. <u>  </u> 2 Day <u>  </u> 3-5 Day																								
Salmonella, Listeria, E.coli, APC, Y & M <u>  </u> 48 Hr. <u>  </u> 3-6 Day																								
Mold <u>  </u> RUSH <u>  </u> 24 Hr <u>  </u> 48 Hr <u>  </u> 3 Day <u>  </u> 5 Day																								
**Turnaround times establish a laboratory priority, subject to laboratory volume and are not guaranteed. Additional fees apply for afterhours, weekends and holidays.**																								
Special Instructions:																								
Client sample ID number (Sample ID's must be unique)																								
1	<u>3W-071012 E</u>	<u>X</u>																						<u>891912</u>
2	<u>3W-071012 N</u>																							<u>13</u>
3	<u>3W-071012 W</u>																							<u>14</u>
4	<u>3W-071012 S</u>																							<u>15</u>
5																								
6																								
7																								
8																								
9																								
10																								

Number of samples received: 4 (Additional samples shall be listed on attached long form.)  
NOTE: REI will analyze incoming samples based upon information received and will not be responsible for errors or omissions in calculations resulting from the inaccuracy of original data. By signing client/company representative agrees that submission of the following samples for requested analysis as indicated on this Chain of Custody shall constitute an analytical services agreement with payment terms of NET 30 days, failure to comply with payment terms may result in a 1.5% monthly interest surcharge.

Relinquished By: <u>[Signature]</u>	FedEx	Date/Time: <u>7/10/12</u>	Sample Condition: On Ice Sealed Intact
Laboratory Use Only			Temp. (F°) Yes / No Yes / No Yes / No
Received By: <u>[Signature]</u>	Date/Time: <u>7.12.12</u>	Carrier: <u>FedEx</u>	
Results:	Contact Phone Email Fax Date Time Initials	Contact Phone Email Fax Date Time Initials	
	Contact Phone Email Fax Date Time Initials	Contact Phone Email Fax Date Time Initials	

7285 9947 3386

## Attachment I

Key to Count Sheets  
Count Sheets  
Analytical Procedures

Structures identifications consist of an Asbestos Type followed by a Structure Type

### Asbestos Type

A = Amosite  
An = Anthophyllite  
C = Chrysotile  
Cr = Crocidolite  
T = Tremolite

### Structure Types

F = Fiber  
B = Bundle  
C = Cluster  
M = Matrix

ND = no structures detected  
M = other structure associated with a matrix  
NAM = Non Asbestos Mineral  
XGB = partly obscured by a grid bar

### Sizing Conversion

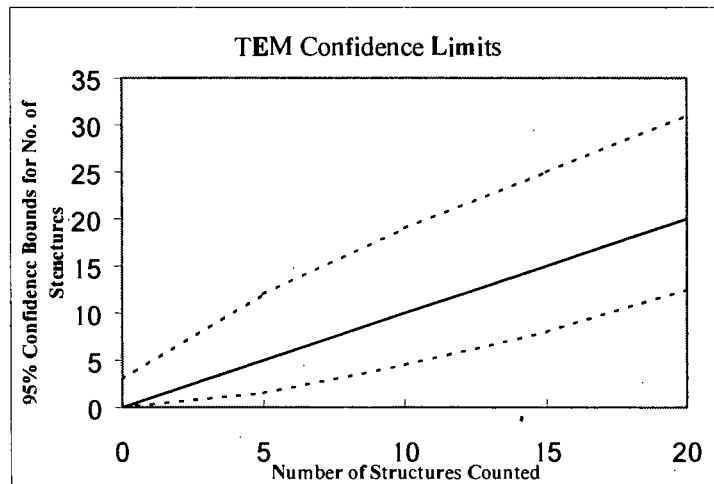
1 length unit = 5 mm on screen = 0.278 micron  
1.80 length units = 0.5 micron  
18.0 length units = 5 microns

1 width unit = 1 mm on screen = 0.0556 micron

### TEM Analysts

Jeanne S. Orr  
Nathan DelHiero  
Angela Heitger  
Jonathan Bernard

Paul D. LoScalzo  
Mark Steiner  
Norberto Zimbleman  
Robert Workman



Upper and lower 95% confidence bounds for the number of structures counted assuming a Poisson distribution.

Reservoirs Environmental, Inc.  
TEM Asbestos Structure Count

Laboratory name:	Reservoirs Environmental, Inc.
Instrument	JEOL 100 CX (N) (S)
Voltage (KV)	100 KV
Magnification	20KX 10KX
Grid opening area (mm <sup>2</sup> )	0.010
Scale: 1L =	0.28 $\mu$ m
Scale: 1D =	0.058 $\mu$ m
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	
QA Type	

Client:	R+R
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm <sup>2</sup> )	979
Date received by lab	7/12/12
Lab Job Number:	239991
Lab Sample Number:	891912

Analyzed by	JB
Analysis date	7/12/12
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

## F-Factor Calculation (Indirect Preps Only):

Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	Width		Amphibole	C	NAM		Sketch	Photo	EDS
A	H2-6	ND												
	G2-6	ND					Pup A	70% asbestos		5-10% debris				
	F2-6	ND					Pup B	60% asbestos		5-10% debris				
	E2-6	ND												
B	G5-4	ND												
	F5-4	ND												
	E5-4	ND												
	F5-3	ND												

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Reservoirs Environmental, Inc.  
TEM Asbestos Structure Count

Laboratory name:	Reservoirs Environmental, Inc.
Instrument	JEOL 100 CX (N) (S)
Voltage (KV)	100 KV
Magnification	20KX 10KX
Grid opening area (mm <sup>2</sup> )	0.010
Scale: 1L =	0.28 $\mu$ m
Scale: 1D =	0.056 $\mu$ m
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	
QA Type	

Client :	R+R
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm <sup>2</sup> )	979
Date received by lab	7/12/12
Lab Job Number:	239991
Lab Sample Number	891913

Analyzed by	JB
Analysis date	7/12/12
Method (D=Direct, I=Indirect, IA=indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

## F-Factor Calculation (Indirect Preps Only):

Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	Width		Amphibole	C	NAM		Sketch	Photo	EDS
A	F5-1	ND												
	E5-1	ND												
	C5-1	ND												
	B5-1	ND												
B	K5-6	ND												
	H5-6	ND												
	G5-6	ND												
	F5-6	ND												

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material



Reservoirs Environmental, Inc.  
TEM Asbestos Structure Count

Laboratory name:	Reservoirs Environmental, Inc.
Instrument	JEOL 100 CX (N) (S)
Voltage (KV)	100 KV
Magnification	201CX 10KX
Grid opening area (mm <sup>2</sup> )	0.010
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	
QA Type	

Client:	R+R
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm <sup>2</sup> )	979
Date received by lab	7/12/12
Lab Job Number:	239991
Lab Sample Number:	891914

Analyzed by	JB
Analysis date	7/12/12
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

## F-Factor Calculation (Indirect Preps Only):

Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	Width		Amphibole	C	NAM		Sketch	Photo	EDS
A	#4-1	ND					Pup A or B ~60% in Lab 7/12/12				5/6 debris			
	#4-1	ND												
	#4-1	ND												
	F4-1	ND												
B	F2-6	ND												
	E2-6	ND												
	F4-1	ND												
	E4-1	ND												

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Reservoirs Environmental, Inc.  
TEM Asbestos Structure Count

Laboratory name:	Reservoirs Environmental, Inc.
Instrument	JEOL 100 CX (N)(S)
Voltage (KV)	100 KV
Magnification	20KX 10KX
Grid opening area (mm <sup>2</sup> )	0.010
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	
QA Type	

Client :	R&R
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm <sup>2</sup> )	977
Date received by lab	7/12/12
Lab Job Number:	239991
Lab Sample Number:	891915

Analyzed by	JB
Analysis date	7/12/12
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

## F-Factor Calculation (Indirect Preps Only):

Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	Width		Amphibole	C	NAM		Sketch	Photo	EDS
A	G3-3	ND												
	F4-4	ND					Pump A	70% intact		5% debris				
	E4-4	ND					Pump B	60% intact		5% debris				
	L4-4	ND												
B	G3-1	ND												
	F3-1	ND												
	E3-1	ND												
	E3-3	ND												

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

## Analytical Procedures – AHERA

Transmission electron microscopy/energy dispersive X-ray spectrometry/selected area electron diffraction (TEM/EDX/SAED) was employed in the analysis of the samples, which were collected on 25 mm mixed cellulose ester air filters. A portion of each filter was collapsed with acetone and etched in a plasma asher. The etched filter was then coated with a thin layer of carbon in a carbon side down. The sample was then placed inside a condensation washer and treated with acetone to remove the filter matrix and expose any inert material.

For each sample, enough grid openings on a 200 mesh TEM grid are analyzed to ensure an analytical sensitivity of at least 0.005 structures/cc. A minimum of four grid openings from two preparations are analyzed for each sample. The grid openings are searched for fibrous structures which, if present are analyzed by SAED and/or EDX (elemental analysis). The AHERA protocol requires SAED confirmation of enough chrysotile asbestos structures on each sample to cause the sample to exceed 70 structures/mm<sup>2</sup> (usually 4 or 5 structures). Both SAED and EDX confirmation are required of enough amphibole structures on each sample to cause the sample to exceed 70 structures/mm<sup>2</sup> (usually 4 or 5 structures) per sample. Either SAED or EDX is required for the remaining asbestos structures of either type. The morphology of each structure is determined and the length and the diameter of any asbestos structures are recorded. Asbestos fibers, bundles, cluster and matrices were identified and recorded. The asbestos structures have been defined in AHERA as follows:

<b>Fiber:</b>	is a structure having a minimum length greater than or equal to 0.5 micron with an aspect ratio of 5:1 or greater with substantially parallel sides.
<b>Bundle:</b>	is a structure composed of three or more fibers in parallel arrangement, with each fiber closer than the diameter of one fiber.
<b>Cluster:</b>	is a structure with fibers in random arrangements such that all fibers are intermixed and no single fiber is isolated from the group.
<b>Matrix:</b>	is a fiber or fibers with one end free and the other end embedded or hidden by a particulate. The exposed fiber end must meet the fiber definition given above.

If more than 50 asbestos structures are identified and confirmed on a sample, AHERA analysis may be terminated after completion of the grid opening, which contains the 50<sup>th</sup> structure. AHERA protocol requires the laboratory to reject any clearance sample which contains in excess of 25% total particulate loading or which appears to be unevenly loaded.

The AHERA protocol includes specific sampling requirements, including minimum numbers of samples and minimum air volumes. Specifically, the 70 structures/mm<sup>2</sup> clearance criteria is only allowed for sets five inside samples (collected in a group of 13 samples including: five outsides and three blanks) with volumes greater than 1200 liters (40 CFR Part 763, page 41894). Deviation from the AHERA sampling protocol may affect the validity of the analytical results. Analysis of samples collected by non-protocol methods are not accredited by NVLAP

### Equations Used for Calculations

$$\text{Area Analyzed, mm}^2 = \# \text{ GO counted} \times \text{Average GO Area (mm}^2\text{)}$$

$$\text{Concentration, s/cc} = \frac{\# \text{ Asbestos Structures}}{\# \text{ GO Counted}} \times \frac{1}{\text{Volume (L)}} \times \frac{\text{Eff. Filter Area (mm}^2\text{)}}{\text{Average GO area (mm}^2\text{)}} \times \frac{1\text{L}}{1000\text{cc}}$$

$$\text{Filter loading, s/mm}^2 = \frac{\# \text{ Asbestos structures}}{\text{Area Analyzed (mm}^2\text{)}}$$

GO = TEM grid opening



July 13, 2012

Laboratory Code: RES  
Subcontract Number: NA  
Laboratory Report: RES 239995-1  
Project # / P.O. #: None Given  
Project Description: 3rd West Sub

David Roskelley  
R & R Environmental  
47 West 9000 South #2  
Sandy UT 84070

Dear Customer,

Reservoirs Environmental, Inc. is an analytical laboratory accredited for the analysis of Industrial Hygiene and Environmental matrices by the National Voluntary Laboratory Accreditation Program (NVLAP), Lab Code 101896-0 for Transmission Electron Microscopy (TEM) and Polarized Light Microscopy (PLM) analysis and the American Industrial Hygiene Association (AIHA), Lab ID 101533 - Accreditation Certificate #480 for Phase Contrast Microscopy (PCM) analysis. This laboratory is currently proficient in both Proficiency Testing and PAT programs respectively.

Reservoirs Environmental, Inc. has analyzed the following samples for asbestos content as per your request. The analysis has been completed in general accordance with the appropriate methodology as stated in the attached analysis table. The results have been submitted to your office.

RES 239995-1 is the job number assigned to this study. This report is considered highly confidential and the sole property of the customer. Reservoirs Environmental, Inc. will not discuss any part of this study with personnel other than those of the client. The results described in this report only apply to the samples analyzed. This report must not be used to claim endorsement of products or analytical results by NVLAP or any agency of the U.S. Government. This report shall not be reproduced except in full, without written approval from Reservoirs Environmental, Inc. Samples will be disposed of after sixty days unless longer storage is requested. If you have any questions about this report, please feel free to call 303-964-1986.

Sincerely,

A handwritten signature in cursive script, appearing to read "Jeanne Spencer", is written over a horizontal line.

Jeanne Spencer  
President

# RESERVOIRS ENVIRONMENTAL, INC.

NVLAP Lab Code 101896-0; TDH: #30-0015

TABLE I. TEM AIR FILTER SAMPLE DATA AND ANALYTICAL RESULTS

RES Job Number: RES 239995-1  
Client: R & R Environmental  
Client Project Number / P.O.: None Given  
Client Project Description: 3rd West Sub  
Date Samples Received: July 12, 2012  
Analysis Type: TEM, AHERA  
Turnaround: 24 Hour  
Date Samples Analyzed: July 13, 2012

Client ID Number	Lab ID Number	Area Analyzed (mm <sup>2</sup> )	Air Volume Sampled (L)	Number of Asbestos Structures Detected	Analytical Sensitivity (s/cc)	Asbestos Concentration (s/cc)	Filter Loading (s/mm <sup>2</sup> )
3W-071112 E	EM 891916	0.0800	984	ND	0.0049	BAS	BAS
3W-071112 N	EM 891917	0.0800	984	ND	0.0049	BAS	BAS
3W-071112 W	EM 891918	0.0800	984	ND	0.0049	BAS	BAS
3W-071112 S	EM 891919	0.0800	986	NO	0.0049	BAS	BAS

NA = Not Analyzed  
ND = None Detected  
BAS = Below Analytical Sensitivity  
Average Grid Opening in mm<sup>2</sup> = 0.010

Filter Material = Mixed Cellulose Ester  
Filter Diameter = 25 mm  
Effective Filter Area = 385 sq mm

AC  
DATA QA

Due Date: 7-13-12Due Time: 8:30**REILAB Reservoirs Environmental, Inc.**5801 Lagan St. Denver, CO 80216 • Ph: 303 904-1988 • Fax 303-477-4275 • Toll Free 866-RES-ENV  
Pager: 303-808-2098

RES 239995

## INVOICE TO: (IF DIFFERENT)

## CONTACT INFORMATION:

Company: <u>R&amp;R Environmental</u>	Company:	Contact: <u>Dave Roskelley</u>	Contact:
Address: <u>47 W 9000 S #2</u>	Address:	Phone:	Phone:
<u>Sandy Ut. 84070</u>		Fax:	Fax:
		Cell/pager: <u>801 541-1035</u>	Cell/pager:
Project Number and/or P.O. #:	Final Data Deliverable Email Address: <u>dave@rrenviro.com</u>		
Project Description/Location: <u>3rd West Sub</u>			

ASBESTOS LABORATORY HOURS: Weekdays: 7am - 7pm		REQUESTED ANALYSIS												VALID MATRIX CODES		LAB NOTES:			
PLM / PCM / TEM	<u>   </u> RUSH (Same Day) <u>X</u> PRIORITY (Next Day) <u>   </u> STANDARD													Alr = A	Bulk = B				
(Rush PCM = 2hr, TEM = 6hr.)														Dust = D	Paint = P				
CHEMISTRY LABORATORY HOURS: Weekdays: 8am - 5pm														Soil = S	Wipe = W				
Metal(s) / Dust	<u>   </u> RUSH <u>   </u> 24 hr. <u>   </u> 3-5 Day													Swab = SW	F = Food				
RCRA S / Metals & Welding	<u>   </u> RUSH <u>   </u> S day <u>   </u> 10 day													Drinking Water = DW	Waste Water = WW				
Fume Scan / TCLP	<u>   </u> RUSH <u>   </u> S day <u>   </u> 10 day													O = Other					
Organics	<u>   </u> 24 hr. <u>   </u> S day <u>   </u> S Day													**ASTM E1782 approved wipe media only**					
MICROBIOLOGY LABORATORY HOURS: Weekdays: 9am - 6pm														Sample Volume (L) / Area	Matrix Code	# Containers	Date Collected m/d/yyyy	Time Collected h:mm:ap	EM Number (Laboratory Use Only)
E.coli O157:H7, Coliforms, S.aureus	<u>   </u> 24 hr. <u>   </u> 2 Day <u>   </u> 3-5 Day																		
Salmonella, Listeria, E.coli, APC, Y & M	<u>   </u> 48 Hr. <u>   </u> 3-5 Day																		
Mold	<u>   </u> RUSH <u>   </u> 24 Hr <u>   </u> 48 Hr <u>   </u> 3 Day <u>   </u> 5 Day																		
**Turnaround times establish a laboratory priority, subject to laboratory volume and are not guaranteed. Additional fees apply for afterhours, weekends and holidays.**																			
Special Instructions:																			
Client sample ID number (Sample ID's must be unique)																			
1	<u>3W-071112 E</u>													<u>984</u>	<u>A</u>		<u>7/11/12</u>		<u>891916</u>
2	<u>3W-071112 N</u>													<u>984</u>					<u>12</u>
3	<u>3W-071112 W</u>													<u>984</u>					<u>18</u>
4	<u>3W-071112 S</u>													<u>986</u>					<u>19</u>
5																			
6																			
7																			
8																			
9																			
10																			

Number of samples received: 4 (Additional samples shall be listed on attached long form.)

NOTE: REI will analyze incoming samples based upon information received and will not be responsible for errors or omissions in calculations resulting from the inaccuracy of original data. By signing client/company representative agrees that submission of the following samples for requested analysis as indicated on this Chain of Custody shall constitute an analytical services agreement with payment terms of NET 30 days, failure to comply with payment terms may result in a 1.5% monthly interest surcharge.

Relinquished By: <u>[Signature]</u>	Fed Ex	Date/Time: <u>7/11/12</u>	Sample Condition: On Ice Sealed Intact
Laboratory Use Only			Temp. (F°) Yes / No Yes / No Yes / No
Received By: <u>[Signature]</u>	Date/Time: <u>7-12-12</u>	Carrier: <u>Fed Ex</u>	
Results:	Contact Phone Email Fax Date Time Initials	Contact Phone Email Fax Date Time Initials	
	Contact Phone Email Fax Date Time Initials	Contact Phone Email Fax Date Time Initials	

7937 6286 8011

## Attachment I

Key to Count Sheets  
Count Sheets  
Analytical Procedures

Structures identifications consist of an Asbestos Type followed by a Structure Type

### Asbestos Type

A = Amosite  
An = Anthophyllite  
C = Chrysotile  
Cr = Crocidolite  
T = Tremolite

### Structure Types

F = Fiber  
B = Bundle  
C = Cluster  
M = Matrix

ND = no structures detected  
M = other structure associated with a matrix  
NAM = Non Asbestos Mineral  
XGB = partly obscured by a grid bar

### Sizing Conversion

1 length unit = 5 mm on screen = 0.278 micron

1.80 length units = 0.5 micron

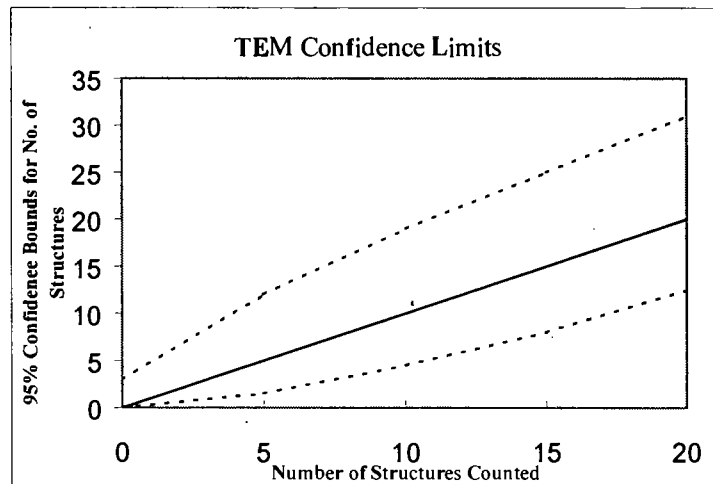
18.0 length units = 5 microns

1 width unit = 1 mm on screen = 0.0556 micron

### TEM Analysts

Jeanne S. Orr  
Nathan DelHiero  
Angela Heitger  
Jonathan Bernard

Paul D. LoScalzo  
Mark Steiner  
Norberto Zimbleman  
Robert Workman



Upper and lower 95% confidence bounds for the number of structures counted assuming a Poisson distribution.

Reservoirs Environmental, Inc.  
TEM Asbestos Structure Count

Laboratory name:	Reservoirs Environmental, Inc.
Instrument	JEOL 100 CX (N) (S)
Voltage (KV)	100 KV
Magnification	(20KX) 10KX
Grid opening area (mm <sup>2</sup> )	0.010
Scale: 1L =	0.28 $\mu$ m
Scale: 1D =	0.056 $\mu$ m
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	
QA Type	

Client:	R+R
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm <sup>2</sup> )	984
Date received by lab	7/12/12
Lab Job Number:	259995
Lab Sample Number:	891916

Analyzed by	JB
Analysis date	7/13/12
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

## F-Factor Calculation (Indirect Preps Only):

Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	Width		Amphibole	C	NAM		Sketch	Photo	EDS
A	E3-4	ND												
	C3-4	ND					Pump A	80% input		5-10% debris				
	E4-4	ND					Pump B	50% input		5-10% debris				
	C4-4	ND												
B	C2-6	ND												
	E4-1	ND												
	E4-3	ND												
	C4-3	ND												

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material



Reservoirs Environmental, Inc.  
TEM Asbestos Structure Count

Laboratory name:	Reservoirs Environmental, Inc.
Instrument	JEOL 100 CX (N) (S)
Voltage (KV)	100 KV
Magnification	(20KX) 10KX
Grid opening area (mm <sup>2</sup> )	0.010
Scale: 1L =	0.28 $\mu$ m
Scale: 1D =	0.056 $\mu$ m
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	
QA Tvoe	

Client:	R+R
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm <sup>2</sup> )	984
Date received by lab	7/12/12
Lab Job Number:	25995
Lab Sample Number:	891917

## F-Factor Calculation (Indirect Preps Only):

Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Analyzed by	JB
Analysis date	7/13/12
Method (D=Direct, I=indirect, IA=Indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	Width		Amphibole	C	NAM		Sketch	Photo	EDS
A	H4-1	ND					Pmp A	~60% in bulk	5-10% debris					
	G4-1	ND					Pmp B	80% in bulk	5/10% debris					
	F4-1	ND												
B	H4-3	ND												
B	G6-1	ND												
	F6-1	ND												
	E6-1	ND												
	C6-1	ND												

JB  
7/13/12

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Reservoirs Environmental, Inc.  
TEM Asbestos Structure Count

Laboratory name:	Reservoirs Environmental, Inc.
Instrument	JEOL 100 CX (N) (S)
Voltage (KV)	100 KV
Magnification	20KX 10KX
Grid opening area (mm <sup>2</sup> )	0.010
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	
QA Type	

Client:	R+R
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm <sup>2</sup> )	984
Date received by lab	7/12/12
Lab Job Number:	25995
Lab Sample Number:	891918

Analyzed by	JB
Analysis date	7/13/12
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

## F-Factor Calculation (Indirect Preps Only):

Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	Width		Amphibole	C	NAM		Sketch	Photo	EDS
A	L5-3	ND												
	K5-3	ND					Pup & 9B	~60% unbrk			5-10% of brk			
	H5-3	ND												
	G5-3	ND												
B	G3-4	ND												
	F3-4	ND												
	E3-4	ND												
	C3-4	ND												

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Reservoirs Environmental, Inc.  
TEM Asbestos Structure Count

Laboratory name:	Reservoirs Environmental, Inc.
Instrument	JEOL 100 CX (N) (S)
Voltage (KV)	100 KV
Magnification	(20KX) 10KX
Grid opening area (mm <sup>2</sup> )	0.010
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	
QA Tyce	

Client:	R+R
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm <sup>2</sup> )	780
Date received by lab	7/12/12
Lab Job Number:	259995
Lab Sample Number:	891919

## F-Factor Calculation (Indirect Pres Only):

Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Analyzed by	JB
Analysis date	7/13/12
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	Width		Amphibole	C	NAM		Sketch	Photo	EOS
A	K4-3	ND					Pimp A	50% in bulk			5-10% in debris			
	H4-3	ND					Pimp B	60% in bulk			5-10% in debris			
	K4-1	ND												
	H4-4	ND												
B	E3-6	ND												
	C3-6	ND												
	E2-3	ND												
	C2-3	ND												

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

## Analytical Procedures – AHERA

Transmission electron microscopy/energy dispersive X-ray spectrometry/selected area electron diffraction (TEM/EDX/SAED) was employed in the analysis of the samples, which were collected on 25 mm mixed cellulose ester air filters. A portion of each filter was collapsed with acetone and etched in a plasma asher. The etched filter was then coated with a thin layer of carbon in a carbon side down. The sample was then placed inside a condensation washer and treated with acetone to remove the filter matrix and expose any inert material.

For each sample, enough grid openings on a 200 mesh TEM grid are analyzed to ensure an analytical sensitivity of at least 0.005 structures/cc. A minimum of four grid openings from two preparations are analyzed for each sample. The grid openings are searched for fibrous structures which, if present are analyzed by SAED and/or EDX (elemental analysis). The AHERA protocol requires SAED confirmation of enough chrysotile asbestos structures on each sample to cause the sample to exceed 70 structures/mm<sup>2</sup> (usually 4 or 5 structures). Both SAED and EDX confirmation are required of enough amphibole structures on each sample to cause the sample to exceed 70 structures/mm<sup>2</sup> (usually 4 or 5 structures) per sample. Either SAED or EDX is required for the remaining asbestos structures of either type. The morphology of each structure is determined and the length and the diameter of any asbestos structures are recorded. Asbestos fibers, bundles, cluster and matrices were identified and recorded. The asbestos structures have been defined in AHERA as follows:

- Fiber:** is a structure having a minimum length greater than or equal to 0.5 micron with an aspect ratio of 5:1 or greater with substantially parallel sides.
- Bundle:** is a structure composed of three or more fibers in parallel arrangement, with each fiber closer than the diameter of one fiber.
- Cluster:** is a structure with fibers in random arrangements such that all fibers are intermixed and no single fiber is isolated from the group.
- Matrix:** is a fiber or fibers with one end free and the other end embedded or hidden by a particulate. The exposed fiber end must meet the fiber definition given above.

If more than 50 asbestos structures are identified and confirmed on a sample, AHERA analysis may be terminated after completion of the grid opening, which contains the 50<sup>th</sup> structure. AHERA protocol requires the laboratory to reject any clearance sample which contains in excess of 25% total particulate loading or which appears to be unevenly loaded.

The AHERA protocol includes specific sampling requirements, including minimum numbers of samples and minimum air volumes. Specifically, the 70 structures/mm<sup>2</sup> clearance criteria is only allowed for sets five inside samples (collected in a group of 13 samples including: five outsides and three blanks) with volumes greater than 1200 liters (40 CFR Part 763, page 41894). Deviation from the AHERA sampling protocol may affect the validity of the analytical results. Analysis of samples collected by non-protocol methods are not accredited by NVLAP

### Equations Used for Calculations

$$\text{Area Analyzed, mm}^2 = \# \text{ GO counted} \times \text{Average GO Area (mm)}$$

$$\text{Concentration, s/cc} = \frac{\# \text{ Asbestos Structures}}{\# \text{ GG Counted}} \times \frac{1}{\text{Volume (L)}} \times \frac{\text{Eff. Filter Area (mm}^2\text{)}}{\text{Average GO area (mm}^2\text{)}} \times \frac{1\text{L}}{1000\text{cc}}$$

$$\text{Filter loading, s/mm}^2 = \frac{\# \text{ Asbestos structures}}{\text{Area Analyzed (mm}^2\text{)}}$$

GO = TEM grid opening



July 16, 2012

Laboratory Code: RES  
Subcontract Number: NA  
Laboratory Report: RES 240072-1  
Project # / P.O. #: None Given  
Project Description: 3rd West Sub - RMP

David Roskelley  
R & R Environmental  
47 West 9000 South #2  
Sandy UT 84070

Dear Customer,

Reservoirs Environmental, Inc. is an analytical laboratory accredited for the analysis of Industrial Hygiene and Environmental matrices by the National Voluntary Laboratory Accreditation Program (NVLAP), Lab Code 101896-0 for Transmission Electron Microscopy (TEM) and Polarized Light Microscopy (PLM) analysis and the American Industrial Hygiene Association (AIHA), Lab ID 101533 - Accreditation Certificate #460 for Phase Contrast Microscopy (PCM) analysis. This laboratory is currently proficient in both Proficiency Testing and PAT programs respectively.

Reservoirs Environmental, Inc. has analyzed the following samples for asbestos content as per your request. The analysis has been completed in general accordance with the appropriate methodology as stated in the attached analysis table. The results have been submitted to your office.

RES 240072-1 is the job number assigned to this study. This report is considered highly confidential and the sole property of the customer. Reservoirs Environmental, Inc. will not discuss any part of this study with personnel other than those of the client. The results described in this report only apply to the samples analyzed. This report must not be used to claim endorsement of products or analytical results by NVLAP or any agency of the U.S. Government. This report shall not be reproduced except in full, without written approval from Reservoirs Environmental, Inc. Samples will be disposed of after sixty days unless longer storage is requested. If you have any questions about this report, please feel free to call 303-964-1986.

Sincerely,

A handwritten signature in cursive script, appearing to read "Jeanne Spencer".

Jeanne Spencer  
President

# RESERVOIRS ENVIRONMENTAL, INC.

NVLAP Lab Code 101896-0; TDH: #30-0015

TABLE I. TEM AIR FILTER SAMPLE DATA AND ANALYTICAL RESULTS

RES Job Number: RES 240072-1  
Client: R & R Environmental  
Client Project Number / P.O.: None Given  
Client Project Description: 3rd West Sub - RMP  
Date Samples Received: July 13, 2012  
Analysis Type: TEM, AHERA  
Turnaround: 24 Hour  
Date Samples Analyzed: July 14, 2012

Client ID Number	Lab ID Number	Area Analyzed (mm <sup>2</sup> )	Air Volume Sampled (L)	Number of Asbestos Structures Detected	Analytical Sensitivity (s/cc)	Asbestos Concentration (s/cc)	Filter Loading (s/mm <sup>2</sup> )
3W-071212 E	EM 892198	0.0900	902	ND	0.0047	BAS	BAS
3W-071212 N	EM 892199	0.0900	902	ND	0.0047	BAS	BAS
3W-071212 W	EM 892200	0.0900	902	ND	0.0047	BAS	BAS
3W-071212 S	EM 892201	0.0900	902	ND	0.0047	BAS	BAS

NA = Not Analyzed  
ND = None Detected  
BAS = Below Analytical Sensitivity  
Average Grid Opening in mm<sup>2</sup> = 0.010

Filter Material = Mixed Cellulose Ester  
Filter Diameter = 25 mm  
Effective Filter Area = 385 sq mm

*[Signature]*  
Date: 7/14/12  
By: [Signature]  
Title: [Signature]  
Lab: [Signature]

DATA QA

TR# 79861531 8225

Due Date: 7-14 7:16  
Due Time: 9am

RES 240072

**REILAB Reservoirs Environmental, Inc.**  
8801 Logan St. Denver, CO 80216 • Ph: 303 984-1988 • Fax 303-477-4275 • Toll Free .888 RES-ENV  
Pager: 303-508-2098

## INVOICE TO: (IF DIFFERENT)

## CONTACT INFORMATION:

Company: <u>R.E.R. Environmental</u>	Company:	Contact: <u>Dave Raskeley</u>	Contact:
Address: <u>47 W 9000 S #2</u>	Address:	Phone:	Phone:
<u>Sandy, UT 84070</u>		Fax:	Fax:
		Cell/pager: <u>801 541-1035</u>	Cell/pager:
Project Number and/or P.O. #:		First Date Deliverable Email Address:	
Project Description/Location: <u>3rd West Sub- RMP</u>		<u>dave@rerenviro.com</u>	

ASBESTOS LABORATORY HOURS: Weekdays: 7am - 7pm		REQUESTED ANALYSIS												VALID MATRIX CODES				LAB NOTES:
PLM / PCM / TEM	RUSH (Same Day) <input checked="" type="checkbox"/> PRIORITY (Next Day) <input type="checkbox"/> STANDARD													Air = A	Bulk = B			
(Rush PCM = 2hr, TEM = 6hr.)														Dust = D	Paint = P			
CHEMISTRY LABORATORY HOURS: Weekdays: 8am - 5pm														Soil = S	Wipe = W			
Metal(s) / Dust	RUSH 24 hr. 3-5 Day													Swab = SW	F = Food			
RCRA 8 / Metals & Welding	RUSH 5 day 10 day													Drinking Water = DW	Waste Water = WW			
Fume Scan / TCLP														O = Other				
Organics	24 hr. 3 day 5 Day													**ASTM E1782 approved wipe media only**				
MICROBIOLOGY LABORATORY HOURS: Weekdays: 9am - 6pm														Sample Volume (L) / Area	Matrix Code	Data Collected muddyy	Time Collected hh/mm/afp	EM Number (Laboratory Use Only)
E.coli O157:H7, Coliforms, S.aureus	24 hr. 2 Day 3-5 Day																	
Salmonella, Listeria, E.coli, APC, Y & M	48 Hr. 3-5 Day																	
Mold	RUSH 24 Hr 48 Hr 3 Day 5 Day																	
Special Instructions:																		
Client sample ID number (Sample ID's must be unique)																		
1	3W-071212 E	X																892198
2	3W-071212 A1																	99
3	3W-071212 W																	00
4	3W-071212 S																	01
5																		
6																		
7																		
8																		
9																		
10																		

Number of samples received: 4 (Additional samples shall be listed on attached long form.)

NOTE: REI will analyze incoming samples based upon information received and will not be responsible for errors or omissions in calculations resulting from the inaccuracy of original data. By signing client/company representative agrees that submission of the following samples for requested analysis as indicated on this Chain of Custody shall constitute an analytical services agreement with payment terms of NET 30 days, failure to comply with payment terms may result in a 1.5% monthly interest surcharge.

Relinquished By: <u>[Signature]</u>	Fed Ex	Date/Time: <u>7/12/12</u>	Sample Condition: On Ice Sealed Intact
Laboratory Use Only			Temp. (F°) Yes / No Yes / No <u>Yes / No</u>
Received By: <u>[Signature]</u>	Date/Time: <u>7-13 9am</u>	Carrier: <u>Fedex</u>	
Results: Contact <u>Dave</u> Phone Email Fax	Date <u>7/14</u> Time <u>2:50</u> Initials <u>TR</u>	Contact <u>[Signature]</u> Phone Email Fax	Date <u>7/14/12</u> Time <u>2:35</u> Initials <u>[Signature]</u>
Contact	Phone Email Fax	Contact	Phone Email Fax
Date	Time	Date	Time
Initials	Initials	Initials	Initials

## Attachment I

Key to Count Sheets  
Count Sheets  
Analytical Procedures

Structures identifications consist of an Asbestos Type followed by a Structure Type

### Asbestos Type

A = Amosite  
An = Anthophyllite  
C = Chrysotile  
Cr = Crocidolite  
T = Tremolite

### Structure Types

F = Fiber  
B = Bundle  
C = Cluster  
M = Matrix

ND = no structures detected  
M = other structure associated with a matrix  
NAM = Non Asbestos Mineral  
XGB = partly obscured by a grid bar

### Sizing Conversion

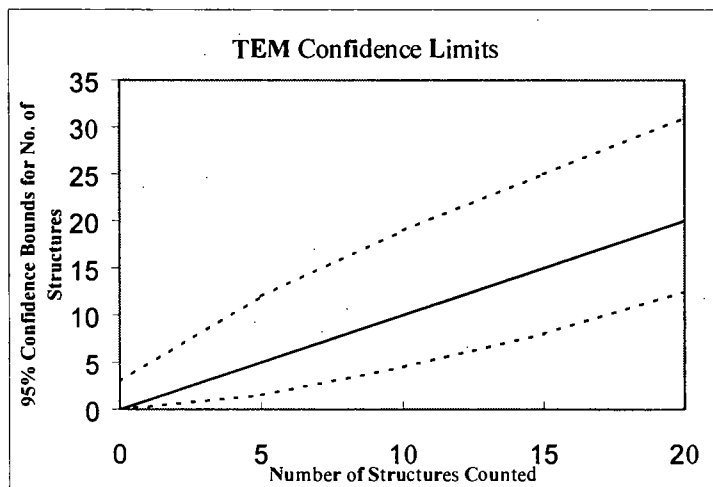
1 length unit = 5 mm on screen = 0.278 micron  
1.80 length units = 0.5 micron  
18.0 length units = 5 microns

1 width unit = 1 mm on screen = 0.0556 micron

### TEM Analysts

Jeanne S. Orr  
Nathan DelHiero  
Angela Heitger  
Jonathan Bernard

Paul D. LoScalzo  
Mark Steiner  
Norberto Zimbleman  
Robert Workman



Upper and lower 95% confidence bounds for the number of structures counted assuming a Poisson distribution.



Reservoirs Environmental, Inc.  
TEM Asbestos Structure Count

Laboratory name:	Reservoirs Environmental, Inc.
Instrument	JEOL 100 CX (N) (S)
Voltage (KV)	100 KV
Magnification	20KX 10KX
Grid opening area (mm <sup>2</sup> )	0.010
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	
QA Type	

Client :	R + R
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm <sup>2</sup> )	902
Date received by lab	7/13/12
Lab Job Number:	240072
Lab Sample Number	892198

## F-Factor Calculation (Indirect Preps Only):

Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Analyzed by	JK
Analysis date	7/14/12
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	Width		Amphibole	C	NAM		Sketch	Photo	EDS
A	H4-6	NO												
	L4-6	NO					Fraser A	80% intact	58 debris					
	F4-6	NO												
	E4-6	NO					Fraser B	~60% intact	58 debris					
	C4-6	NO												
B	G4-3	NO												
	F4-3	NO												
	E4-3	NO												
	G3-4	NO												

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Reservoirs Environmental, Inc.  
TEM Asbestos Structure Count

Laboratory name:	Reservoirs Environmental, Inc.
Instrument	JEOL 100 CX (N) (S)
Voltage (KV)	100 KV
Magnification	20KX 10KX
Grid opening area (mm <sup>2</sup> )	0.010
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	
QA Type	

Client:	R + R
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm <sup>2</sup> )	902
Date received by lab	7/13/12
Lab Job Number:	24072
Lab Sample Number:	892199

## F-Factor Calculation (Indirect Preps Only):

Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Analyzed by	TK
Analysis date	7/14/12
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scops Alignment	Date Analyzed

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	Width		Amphibole	C	NAM		Sketch	Photo	EDS
A	EH-3	ND												
	CH-3	ND												
	BH-3	ND												
	EH-3	ND												
B	CH-3	ND												
	CH-3	ND												
	EH-3	ND												
	EH-3	ND												
	EH-4	ND												

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Reservoirs Environmental, Inc.  
TEM Asbestos Structure Count

Laboratory name:	Reservoirs Environmental, Inc.
Instrument	JEOL 100 CX (N) (S)
Voltage (KV)	100 KV
Magnification	20KX 10KX
Grid opening area (mm <sup>2</sup> )	0.010
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	
QA Type	

Client :	R + R
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm <sup>2</sup> )	902
Date received by lab	7/13/12
Lab Job Number	240072
Lab Sample Number	892100

## F-Factor Calculation (Indirect Preps Only):

Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Analyzed by	TK
Analysis date	7/14/12
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting miles (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	Width		Amphibole	C	NAM		Sketch	Photo	EDS
A	C4-1	ND												
	B4-1	ND			Prep A 50% intact 5% debris									
	C5-1	ND												
	B5-1	ND			Prep B 60% intact 5% debris									
	B4-3	ND												
B	G5-1	ND												
	F5-1	ND												
	E5-1	ND												
	E4-6	ND												

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Reservoirs Environmental, Inc.  
TEM Asbestos Structure Count

Laboratory name:	Reservoirs Environmental, Inc.
Instrument	JEOL 100 CX (N) (S)
Voltage (KV)	100 KV
Magnification	20KX 10KX
Grid opening area (mm <sup>2</sup> )	0.010
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	
QA Tyoe	

Client :	R + R
Sample Tyoe (A=Air, D=Dust):	A
Air volume (L) or dust area (cm <sup>2</sup> )	902
Date received by lab	7/13/12
Lab Job Number:	24072
Lab Sample Number:	892201

## F-Factor Calculation (Indirect Preps Only):

Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Analyzed by	JK
Analysis date	7/14/12
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting mles (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	Width		Amphibola	C	NAM		Sketch	Photo	EDS
A	G4-1	ND												
	F4-1	ND			Prep A for intake 58 labors									
	G4-6	ND												
	F4-6	ND			Prep B for A									
	E4-6	ND												
B	F4-1	ND												
	E4-1	ND												
	F3-4	ND												
	E3-4	ND												

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibola

C = Chrysotile

NAM = Non-asbestos material

## Analytical Procedures – AHERA

Transmission electron microscopy/energy dispersive X-ray spectrometry/selected area electron diffraction (TEM/EDX/SAED) was employed in the analysis of the samples, which were collected on 25 mm mixed cellulose ester air filters. A portion of each filter was collapsed with acetone and etched in a plasma asher. The etched filter was then coated with a thin layer of carbon in a carbon side down. The sample was then placed inside a condensation washer and treated with acetone to remove the filter matrix and expose any inert material.

For each sample, enough grid openings on a 200 mesh TEM grid are analyzed to ensure an analytical sensitivity of at least 0.005 structures/cc. A minimum of four grid openings from two preparations are analyzed for each sample. The grid openings are searched for fibrous structures which, if present are analyzed by SAED and/or EDX (elemental analysis). The AHERA protocol requires SAED confirmation of enough chrysotile asbestos structures on each sample to cause the sample to exceed 70 structures/mm<sup>2</sup> (usually 4 or 5 structures). Both SAED and EDX confirmation are required of enough amphibole structures on each sample to cause the sample to exceed 70 structures/mm<sup>2</sup> (usually 4 or 5 structures) per sample. Either SAED or EDX is required for the remaining asbestos structures of either type. The morphology of each structure is determined and the length and the diameter of any asbestos structures are recorded. Asbestos fibers, bundles, cluster and matrices were identified and recorded. The asbestos structures have been defined in AHERA as follows:

<b>Fiber:</b>	is a structure having a minimum length greater than or equal to 0.5 micron with an aspect ratio of 5:1 or greater with substantially parallel sides.
<b>Bundle:</b>	is a structure composed of three or more fibers in parallel arrangement, with each fiber closer than the diameter of one fiber.
<b>Cluster:</b>	is a structure with fibers in random arrangements such that all fibers are intermixed and no single fiber is isolated from the group.
<b>Matrix:</b>	is a fiber or fibers with one end free and the other end embedded or hidden by a particulate. The exposed fiber end must meet the fiber definition given above.

If more than 50 asbestos structures are identified and confirmed on a sample, AHERA analysis may be terminated after completion of the grid opening, which contains the 50<sup>th</sup> structure. AHERA protocol requires the laboratory to reject any clearance sample which contains in excess of 25% total particulate loading or which appears to be unevenly loaded.

The AHERA protocol includes specific sampling requirements, including minimum numbers of samples and minimum air volumes. Specifically, the 70 structures/mm<sup>2</sup> clearance criteria is only allowed for sets five inside samples (collected in a group of 13 samples including: five outsides and three blanks) with volumes greater than 1200 liters (40 CFR Part 763, page 41894). Deviation from the AHERA sampling protocol may affect the validity of the analytical results. Analysis of samples collected by non-protocol methods are not accredited by NVLAP

### Equations Used for Calculations

$$\text{Area Analyzed, mm}^2 = \# \text{ GO counted} \times \text{Average GO Area (mm)}$$

$$\text{Concentration, s/cc} = \frac{\# \text{ Asbestos Structures}}{\# \text{ GO Counted}} \times \frac{1}{\text{Volume (L)}} \times \frac{\text{Eff. Filter Area (mm}^2\text{)}}{\text{Average GO area (mm}^2\text{)}} \times \frac{\text{IL}}{1000\text{cc}}$$

$$\text{Filter loading, s/mm}^2 = \frac{\# \text{ Asbestos structures}}{\text{Area Analyzed (mm}^2\text{)}}$$

GO = TEM grid opening